

# AIR FORCE JOURNAL <sup>of</sup> LOGISTICS

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# AIR FORCE JOURNAL of LOGISTICS

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Research, Development and Logistics

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# AIR FORCE JOURNAL *of* LOGISTICS

## CONTENTS

### ARTICLES

#### 2 Munitions Logistics

Colonel Johnny E. Cormier, USAF

#### 8 CITA Cost Comparison: Systems Analysis Revisited

Major John W. Stone, Jr., USAF

#### 12 The Mobilization Augmentee in Logistics: Using the Potential Now

Major Dennis E. Deuschl, USAFR

#### 14 Operation Planning in Perspective

Major Charles M. Leigh, USAF

#### 20 The Role of Competition in Contracting for Air Freight Movement Within the Domestic Market

Major Roland A. Hassebrock, USAF

Captain John R. Forster, USA

Squadron Leader Mahboob Khan, Pakistan AF

#### 32 Competitive Contractor Field Teams

Norman Cohen

### DEPARTMENTS

6 *USAF Logistics Policy Insight*

19 *Career and Personnel Information*

27 *Current Research*

### ITEMS OF INTEREST

5 LOGCAS 81

30 Reader Survey

### Purpose

The *Air Force Journal of Logistics* is a non-directive quarterly periodical published in accordance with AFR 5-1 to provide an open forum for presentation of research, ideas, issues and information of concern to professional Air Force logisticians and other interested personnel. Views expressed in the articles are those of the author and do not necessarily represent the established policy of the Department of Defense, the Department of the Air Force, the Air Force Logistics Management Center, or the organization where the author works.

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## Munitions Logistics

Colonel Johnny E. Cormier  
*Chief, Munitions and Missiles Division*  
*Directorate of Maintenance and Supply*  
*DCS/Logistics and Engineering*  
*HQ USAF*  
*Washington, D.C. 20330*

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### Introduction

The ability to project overwhelming air power has never been more important to our national security objectives. We must be able to fight outnumbered and win. This requires defeating the maximum number of targets with the least number of sorties in the shortest period of time. Logistically, that means having the right resources at the right places at the right time with assured resupply.

To enhance combat effectiveness, we constantly press the edge of technology, paying the attendant price of new development risks and logistic complexities. Conscious decisions have to be made between filling inventories with current generation weapons or awaiting the development of better systems. While new weapons systems are emerging from development, on-hand resources must be constantly peaked to readiness. Realignment of stockpiles is expensive but necessary to support changes in force beddown. Resupply can only be assured through CONUS reserves, a responsive industrial mobilization base, and adequate sea and air lift.

One lesson clearly learned in the Vietnamese War was the direct relationship between munitions readiness and operational effectiveness. The draft of Secretary of Defense Brown's report to the Congress on the FY 1981 Budget, FY 1982 Authorization Request and FY 1981-1985 Defense Programs reflects, "Combat sustainability—the "staying power" of our combat forces—depends on the continuing availability of weapons, equipment, spare parts, secondary items, munitions, and other supplies to replace those consumed or attrited during combat. Procurement of war reserve stocks (WRS) and enhancement of our industrial preparedness are perhaps the two most important peacetime programs contributing to wartime sustainability." [1] Sustaining those forces that must fly and fight outnumbered, and win, is the foremost challenge to Air Force logistics.

In fact, all our logistics efforts point toward enabling the Air Force to fight outnumbered and win. This objective recognizes the decline of our unquestioned military superiority and the realities of facing numerically superior forces. It also portrays the problems and opportunities that are continually being faced by the Air Force logistician.

The lag time that allowed for industrial and military mobilization in earlier wars has dwindled to none. Conventional combat is now expected to begin abruptly, at intensive rates that surge both operational and support forces. World economics have exhausted our wherewithal to store vast reserves of wartime consumables or hold extensive industrial capabilities in reserve. While the pace of technology now creates obsolescence faster than weapon systems can be acquired, increased concern for environmental preservation constrains the military in its ability to conduct effective training and acquire real estate needed for war readiness.

In spite of these difficulties, the logistics community must find the way to assure effective support to the force. This

paper deals with one of the most basic logistics determinants of the Air Force's ability to fight: conventional munitions support.

### The Right Munitions

Munitions logistics play a significant role in assuring that the right munitions are in the inventory. However, it is the customer who basically drives this part of the readiness equation. Operational commanders and their staff counterparts determine needs, select candidates from development efforts, and decide inventory objectives through their prediction of expenditures.

The logistics interface begins early in the development cycle where concepts of maintainability and supportability are established. After selected munitions transition into production, the logistician carries the ball until the item is eventually phased out of inventory. At the end of the cycle there is a transition phase when a stockpile of older items, those that can serve as substitutes, are retained until the inventory objectives of new items are achieved. This requires a time-phased plan to purge the inventory of obsolete assets at the least cost while protecting options for sustainability. This "selective retention" also provides the wherewithal to support operational forces when the production base cannot meet resupply demands. Stockpile modernization efforts are aided through management of foreign military sales and interservice transfers of stocks from inventory.

Getting the right munitions into the inventory is the first step in logistics effort. Keeping the stockpile ready is another matter. Our policy is to design munitions for at least a ten-year shelf life. Our quality assurance programs are geared toward this readiness objective throughout the life cycle of each munition. There comes the time for decision when costs for continued maintenance have to be balanced against future operational utility. Retention, on a quantitative basis, can reduce opportunities for qualitative acquisitions. This may not be in the best interests of the Air Force. Again, the operations community must judge advantages between satisfying inventory objectives or awaiting the development of better products. Conscious decisions of this nature are with us today. In the early 1970s, the Air Force elected to await the development of the AIM-7F and AIM-9L missiles rather than continue to produce AIM-7E and AIM-9E models.

The air-to-ground munitions share of the annual budget has been relatively stable for the past few years, and this is not likely to change unless significant increases in defense appropriations materialize. The same applies to missile procurement where fiscal year procurement dollars have also remained stable. Although there is a tendency to want inventories filled as quickly as possible, there are disadvantages in achieving these objectives. Production lines would rapidly go to a cold state, adversely affecting our mobilization capability. Full inventories do not allow room for introducing new weapons when breakthroughs in technology

occur. Having the right munitions is nevertheless fundamental to operational combat effectiveness. It is the primary ingredient for the strategies of least-cost-per-target-kill. The logistician faces a difficult balancing act to keep a warm production base, modernize stockpiles, and retain adequate inventories.

### **The Right Place**

Having the right munitions in the right place means that the operational commander can select targets effectively as the situation demands. Distribution of retail assets has to track with current operational requirements. At best, this is an imprecise science. The dynamics of planning for force beddown have historically precluded stability in prepositioning combat consumables.

Adequate overseas stockpiling of munitions is one of the major objectives in our current quest for readiness. During a presentation to the House of Representatives Committee on the Armed Forces, February 1979, the Secretary of the Air Force and the Chief of Staff stated, "Readiness of theater and conventional forces signals US intent and capability to protect its interests and do so below the strategic nuclear threshold. Readiness is a stabilizing force decreasing the likelihood of conflict." [2]

Prepositioned munitions at the right place is one of the most difficult tasks facing the munitions logistician. It takes years to acquire new facilities. The dynamics of force beddown require continuous revisions to prepositioning planning. Movement of munitions is inherently expensive due to added costs for handling hazardous explosives. Efforts to cut costs in the near term often lead to additional costs in the long term. From a logistics point of view, stability in operational planning is the foundation for effective placement of munition stocks at minimum expense.

Increased capabilities from sortie-surge strategies and quick-turn procedures have created demands for an ever-increasing stockpile of prepositioned munitions. The decisions for force dispersal not only drive the demand for additional storage locations but expand the required network of surface resupply lines.

Expansion of overseas prepositioning hinges on acquisition of real estate, improved funding for Military Construction Programs, and host nation support.

Much is being done to have munitions at the right place. There has been a steady growth of storage facilities at operating bases in both overseas theaters. Still, forces must rely on central storage for much of their on-hand stocks. Complex and costly redistribution plans are the means by which these stocks will have to be moved to operating units during the early phase of a war.

In support of tactical mobility, we have developed Standard Air Munitions Packages (STAMPs), each tailored to support a tactical squadron at combat rates. These CONUS-based packages of selected munitions are designed for airlift and kept in constant readiness. Although they are designed to support units deploying to bare base environments, they also can be committed to in-place units that need rapid resupply. Each package contains a general mix of munitions items optimized for a variety of targets.

The retail stocks in the custody of the operating commands are backed by wholesale stocks in CONUS. Under the Department of Defense Single Manager for Conventional Ammunition policy, all USAF wholesale munitions are stored by the Army in depot and arsenal facilities. Although we try to collocate components needed for complete rounds, it is often impractical or unaffordable. The components of a major item usually are often not manufactured in the same general

location. Fuzes produced in Arizona may be for bombs manufactured in Oklahoma. Balancing the beddown of components is driven by availability of space and cost of first destination transportation.

Optimum placement of munitions is constrained by another factor—the ability to retrograde or dispose of obsolete or unserviceable stocks. There is a constant cycle where new munitions are being introduced into inventory as older stocks reach service life expiration. When this occurs in the prepositioned inventory, the availability of retrograde funds becomes critical to stockpile modernization. Where possible, older stocks are transferred from combat reserve to training, released to other Services having a need, or offered for Military Assistance Programs or Foreign Military Sales. Regardless, space must be vacated to make way for the newer items as they are delivered from production. Deficits in second destination transportation funds can delay this transition. Backlogs in disposal programs consume CONUS depot storage space often forcing the malpositioning of newly acquired assets.

In order to rapidly fill prepositioning shortfalls, the overseas major commands have been working with Air Force Logistics Command (AFLC) to develop a preplanned push system for selected stocks. Based on asset availability, operation preference, distribution priority, and available lift, the contingency movement plans, referred to as "Ogden Plans," will guide resupply efforts in the early days of a conflict. These plans are adjusted as prepositioning expands. They are complimentary to concepts of the Initial Preplanned Supply Support (IPSS) program being developed by the Logistics Directorate, Office of the Joint Chiefs of Staff.

### **The Right Time**

Timing is the active ingredient in logistics support for forces in combat. Acquiring the right munitions and distributing them to the right places are preparatory actions based on our best estimate of future uncertainties. Sortie generation at high rates will be the deciding factor in defeating a numerically superior foe. As a result, logistics timing to assure munitions support becomes a critical element in operational effectiveness.

Munitions timing is a complex matter. Those usual time-saving logistic methods of consolidation, centralization, and collocation are usually not feasible with munitions. Explosive hazards jeopardize base operations and armed aircraft threaten other resources unless barricaded and separated. Concentrations of munitions are also vulnerable to mass destruction by enemy attack.

The requirement to be ready for intensive conflict tends to promote the desire for vast quantities of pre-assembled munitions. Although this takes pressure off the initial demand for buildup, it takes its toll elsewhere. Pre-assembled munitions require more space for storage. Once components are pre-assembled, they often have short service lives deteriorating quickly. When these items cannot be consumed in training or other peacetime activities, their loss to the inventory comes at a high price.

In order to reduce hazards, stockpile storage is remoted from operating areas. Small explosive holding areas with a day's supply of ammunition can be tolerated near aircraft loading sites but still require barricades. In each case, the management span of control and operating lines of communication are extended more than required for other support activities. As these factors accumulate, time becomes critical. Just enough munitions can be accepted on the flightline so that risks are minimized. Thus, a constant flow of replenishment assets has to be maintained. Flightline

deliveries must be time-phased to preclude congestion in operating areas. The amount of stock out of hardened storage must be minimized to decrease vulnerability during enemy attack. These extended time-lines leave little margin to accommodate unforeseen difficulties or requirements.

Resupply from the continent or oversea central storage areas is also time sensitive. Manpower is limited and unable to simultaneously accommodate large receipts of stock and conduct extensive buildup operations. Storage capacity may be exceeded by early resupply deliveries leaving new stocks vulnerable to air attack. Furthermore, consumption cannot equate to resupply requirements. The type weapons needed in the early days of combat may diminish in utility as the war progresses. Thus, munitions resupply is necessarily a pull system driven by real-time operational demands.

These problems are being addressed in the changing concepts of munitions logistics. As an example, munitions are designed as all-up-rounds (AUR) where practical. Virtually all cluster bombs are ready to use from their container. Air-to-ground missiles are delivered from the producer as complete rounds, and the AIM-7 Sparrow is transitioning to AUR configuration. There will still be a need for unit assembled modular weapons, such as the GBU-15; however, they will ultimately be in the minority.

New technology also shows great promise in the development of insensitive high explosives. To the logistician, this would mean little or no likelihood of accidental explosion from fire or enemy attack. Stocks could be shipped through normal transportation means without explosive hazards escalating costs or limiting the use of facilities. Although presently feasible for only nuclear applications, this technology will mean a major breakthrough in combat logistics when it can be applied to the conventional stockpile.

### **Resupply**

Even with the right munitions in the right place at the right time, our forces will only be able to fight for a specified period (that time being defined in days by prepositioning objectives). Sustaining combat will, therefore, require immediate establishment of resupply lines, both air and surface. On-hand wholesale stocks must keep the pipeline filled while industry is mobilized. Depot outloading and transportation must be prioritized in advance to satisfy initial resupply objectives.

While the wholesale redistribution process is being accelerated, industrial mobilization becomes a complex undertaking, fraught with limiting variables. Acceleration of warm production lines will be constrained by the ability of vendors to supply piece parts and the availability of skills to meet multishift operations. Load, assembly, and packaging (LAP) output will be constrained by plant capacity and, most of all, the availability of bulk explosive fills.

Activation of cold production lines poses even greater problems. Machinery has to be taken out of layaway status and activated. Lines have to be run to ensure output qualifies against technical specifications. Personnel have to be recruited and trained with time allowed to advance on learning curves before maximum production can be attained. Piece part supply lines from subcontractors and vendors have to be re-established before production can commence.

These are all time consuming and point out the importance of adequate war reserve inventories to assure sustainability in the intervening period. Commonly referred as "D-to-P" planning, war reserves must support forces until demand (d) can be satisfied by production (p). The difference between demand and production supportability is computed as the War Reserve Material (WRM) munitions inventory objective. This computation is usually constrained by logistics policy

specified in the Department of Defense Consolidated Guidance Document. This guidance is reissued annually and drives the calculation of the worldwide inventory objective. Once established, this objective for prepositioning and combat sustainability becomes the goal for munition logisticians.

Funding is obviously the critical element in our capability to sustain combat forces. Funding drives our acquisition programs that not only fill empty bins but modernize the inventory. It also determines the capability of our industrial base, both military and civilian, in responding to mobilization.

Sustainability thus comes at a high price, yet it cannot be compromised. There must be an equity between force structure and support. There must be sufficient munitions, fuel, and spare parts to keep the force in the air. Balancing these resources, so that excesses of one are not faced by deficiencies in another, is a goal not easily achieved.

Production bases and asset availability are different for each class of supply. Lag times for industrial mobilization also differ. To make things even worse, munitions effectiveness and suitability are vulnerable to changes in targets, countermeasures and tactics. Thus, munitions stockpiles must be carefully planned in order to get the most capability for our investment while retaining the flexibility to keep pace with changing technology.

Sustainability boils down to a few critical facts. Our depot stocks must be well maintained and retained until they can no longer be used in any capacity. Our industrial base must be preserved to the extent necessary to meet mobilization demands. Planning for the wholesale inventory must bridge the D-to-P gap. Drawdown of war reserves to satisfy peacetime operational requirements and high priority aid and sales to foreign governments must be carefully controlled. Munitions sustainability is, therefore, directly proportional to adequacy of inventory objectives, stockpile conservation, and responsiveness of the industrial base.

### **Summary**

There are several points that stand clear in meeting the munitions logistics challenge. The impact of change must be considered throughout the planning, programming and budgeting cycle. As new systems enter the inventory, they create logistics demands that can be altered little during their operational lifetime. Stability in force beddown is essential if we are to amortize the high cost of prepositioning. Care and preservation of our war reserve inventories are key to sustaining the force with a mix and quantity of munitions needed to defeat an enemy.

Budget allocation has to be consistent with overall force planning. There must be a balance between the determination of force size and support. Program lead time for construction of facilities must also coincide with force beddown planning. Delivery of aircraft peculiar munitions and support equipment has to keep pace with or lead unit equipage schedules.

Investment in industrial modernization programs must be made before existing resources deteriorate beyond repair. Although this is primarily a responsibility of the Army as executive for the Single Manager program, all services will have to support this objective. War reserves have to be programmed and funded in sufficient quantities if the force is expected to fight a conflict of indefinite duration.

These challenges all translate into funding requirements. The burden of logistics is to minimize these expenses while assuring the best possible support. Requirements have to be carefully and repeatedly scrubbed to eliminate excesses. Maintenance techniques must be continually improved to minimize the demand for manpower and extend the life of our stockpiles. Technology must be exploited to reduce life cycle costs.

Munitions management is not the only logistics challenge nor does it demand priority consideration over other logistic functions such as transportation, supply, or aircraft maintenance. Nevertheless, munitions is a major logistic functional entity and must be specifically addressed as such. In reviewing the lessons learned from World War II, the Korean War, and the Vietnamese War, there has been a tendency to de-emphasize the munitions industrial base in peacetime and permit deterioration of functional support. The time that was available in the past, which afforded mobilization of industry and buildup of resources, will likely be nonexistent in any future conflict. In today's war environment, combat readiness means munitions readiness.

A very popular song, "Praise the Lord and Pass the Ammunition," emerged during World War II. Filled with

rhythm and patriotic words, it nevertheless carried a very poignant message. Without ammunition, we didn't have a prayer in winning. The same holds true for today as well as for tomorrow.

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#### *Item of Interest*

#### **USAF Logistics Capability Assessment Symposium**

The USAF Logistics Capability Assessment Symposium, LOGCAS 81, was held at the USAF Academy 2-6 March. This symposium, the first such meeting of managers and analysts involved in logistics capability assessment, was convened by Major General Theodore D. Broadwater, Director of Plans and Programs, Deputy Chief of Staff/Logistics and Engineering, Headquarters USAF. Colonel Edward L. Uher, Deputy to MGen Broadwater, was the symposium chairman and Lt Colonel Joseph M. Campbell from the Logistics Concepts Division, AF/LEXY, was the vice-chairman.

On the opening day Brigadier General Marvin C. Patton, Executive Director for Supply Operations, Defense Logistics Agency, gave the Keynote Address. His theme was that analysts must provide the higher levels of decision makers with management tools which are backed by logical arguments and valid data.

During the week 29 presentations were made by the participants who represented a wide span of Air Force agencies and contractors. The presentations were given in two parallel sessions conducted to permit this large number of briefings. Each presentation was accompanied by a question and answer period for dialogue between the audience and presenter. Without exception, the participants joined in the spirit of the purpose of the symposium which was to present programs and projects to their peers for critique and sharing of ideas.

In addition to the daily presentations, each afternoon a seminar was held. "The Role of Management and Analysts in Long-Range Planning and Policy Management," "Data Bases - Construction, Validation, and Management," and "Model Verification and Validation" were the subjects of the three seminars.

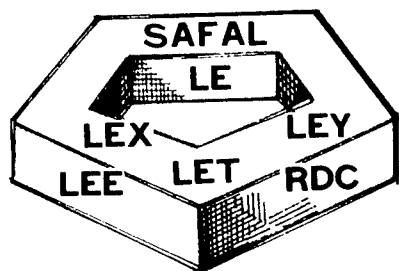
At a mid-week banquet, Mr. Stephen M. Drezner, Vice-President for Project Air Force, The Rand Corporation, delivered the after dinner address. He stressed that the relationship between the manager and analyst must be based on truth and valid analyses.

The symposium was a great success. The opportunity for the participants to learn where logistics capability assessment models, techniques, topics, and projects are presently in use, under development, or in the planning state was invaluable.

The symposium closed on Friday, 6 March, with a discussion among the participants on future directions for logistics capability assessment in the Air Force. Brigadier General Leo Marquez, Deputy Chief of Staff, Plans and Programs, Air Force Logistics Command, gave the closing address. In his closing remarks he identified the need to design a system for a comprehensive, systematic approach to model development. This system should provide direction without being a burden to the managers and analysts.

The LOGCAS 81 Proceedings, containing presentations and papers submitted at the symposium and addresses by the guest speakers, will be available in April 1981. Requests for copies from other than participants should be addressed to:

LOGCAS 81 Executive Secretary  
AFLMC/LGY (Major Denham)  
Gunter AFS AL 36114



# USAF LOGISTICS POLICY INSIGHT

## **Sale of Government Materiel to Maintenance Contractors**

For the past two years the House Appropriations Committee recommended that DOD should sell materiel to contractors performing work on maintenance contracts rather than furnishing it as Government Furnished Materiel (GFM). The Committee believed that the sales concept would: (a) motivate maintenance contractors to order only materiel essential to the contractor, (b) reduce government contract administration workload, and (c) reduce record keeping and reporting associated with contractor management of GFM in their possession. The authority to sell government property is now Public Law (Sec 767, PL 96-154). All Services are now testing the feasibility of the concept.

## **Reciprocal Logistics Support Arrangements with NATO Allies**

The NATO Mutual Support Act of 1979 (Public Law 96-323), enacted in August 1980, authorizes US military forces deployed in Europe and adjacent waters to establish reciprocal logistics support arrangements with NATO allies. Prior to the new public law, transfer of US supplies and services to NATO allies could only be accomplished through foreign military sales which did not allow for mutual support based on reciprocity or replacement in-kind. A Department of Defense directive and instruction outlining implementing guidance to the military departments were published October 1980. Hq USAF/LEX is drafting a regulation to implement PL96-323 which should be published by April 1981.

## **Independent Verification and Validation of Em- bedded Computer Software**

A new Air Force policy on Independent Verification and Validation (IV&V) will be released in 1981. IV&V is an independent assessment process structured to ensure that computer programs fulfill the requirements stated in system specifications and satisfactorily perform the functions required to meet requirements. The new policy will be released in the interim via an Air Force policy letter. It will be incorporated into an update of AFR 800-14 which is currently underway and due to enter coordination during Summer 1981. The new Air Force policy will require that all new software in embedded computers be assessed for potential IV&V application.

## **Defense Retail Interservice Support Incentive Policy**

On 30 January 1981, OASD-MRA&L approved the Air Force concept of adopting interservice incentives in the Defense Retail Interservice Support (DRIS) Program. Implementation of this policy change will be contained in the new DRIS Regulation (DOD 4000.19-R) planned for publication this summer. Under this concept, commanders will have an incentive to arrange for interservice support since a portion of savings achieved would be returned to satisfy established but unfunded base requirements.

## **New AFIT Transportation Graduate Education Program**

Beginning in June 1981, and each June thereafter, approximately ten transportation officers or civilian equivalents will enter a new 15-month transportation management resident graduate education program at the AFIT School of Systems and Logistics, Wright-Patterson AFB, OH. The new program generally consists of the present graduate logistics management curricula with transportation courses added. The new program will provide attendees the knowledge needed to meet the present and future challenges of Air Force transportation. The civilian institution transportation management program will eventually be phased out. A brochure describing the program and admissions criteria is available from: AFIT/LSM, Attn: Maj Harrington, Wright-Patterson AFB, OH 45433. The Air Staff is working with AFIT to insure the new program meets the needs of Air Force transportation.



**3-of-9 Bar Code  
Prototype Testing  
Underway**

The Office of the Secretary of Defense approved the 3-of-9 bar code as the standard symbology for DOD-wide usage in a memorandum to the Services and Defense Logistics Agency on 9 Oct 80. This memorandum also encouraged all DOD components to proceed with implementation of logistics applications. Prototype testing is currently being accomplished in Air Force wholesale receiving, maintenance and base service store operations; Navy segregated ammunition; Defense Logistics Agency shipping and wholesale inventory; and Army retail receiving. This technology has been successfully applied in commercial retail outlets and has great potential for DOD use.

**Comprehensive Engine  
Management System**

The Comprehensive Engine Management System (CEMS) is being developed to be a modern, efficient information system for the management of Air Force engines at base, MAJCOM, and fleet wide level within the Air Force. When fully implemented in 1983 CEMS will replace the D024 reporting system, provide engine diagnostics and complement the engine tracking systems which are currently supporting the On-Condition Maintenance (OCM) concepts on the F-100 and TF-34. Employing an incremental approach of implementing CEMS, the F-100, TF-34 and the TF41 will be the first engines supported with such engines as the TF30, TF33, TF39, J60 and J85 being supported under Increment II. CEMS is being developed as the single management system supporting all commands and all levels of engine management. An in-depth examination of CEMS and its impact on the Air Force is scheduled for publication in the next issue of the *AFJL*.

**Acquisition Logistics  
Policy Implementation**

Four new major acquisition logistics policy documents published during 1980 in the Department of Defense 5000 series of directives and instructions were highlighted in this department in the Fall 1980 issue of the *AFJL*. The thrust of the new DOD policy is to consider logistics supportability an element of systems acquisition of equal importance to cost, schedule, or performance. In August 1980, we began an effort that has culminated in a coordinated Air Force-wide plan for meeting the tough challenges we face in fielding the sustainable and supportable war fighting capability encompassed by the new DOD policy. Air Force implementing directives are now in various stages of revision or coordination. A formal review early this spring will bring together the many MAJCOM participants to see how far we have progressed and determine what more needs to be done. More information is available on this project from Lt Col Bruce W. Ewing, AF/LEYE, AUTOVON 227-0311.

**Hush House Noise  
Sound Suppressors**

With the current interest toward improving environmental protection by reducing noise and air pollution, the Air Force has embarked on purchasing the next generation of engine noise suppressor systems. The Hush House noise suppressor system is an air cooled, demountable system which has been successfully used throughout Europe for the past 14 years. Advantages include extremely low maintenance costs as compared to our present water cooled suppressors, no pollution, and a single suppressor design that can accept a wide range of aircraft and engines. The initial procurement of 25 hush houses for \$45 million will be constructed at both CONUS and overseas bases with follow-on procurement through FY 87.

**Redesign of Cargo  
Mobility Bins**

The DCS/L&E has initiated a project to redesign cargo mobility bins that are space efficient and are compatible for use with Air Force and Civilian Reserve Air Fleet (CRAF) Aircraft. The proposed design will maximize the use of available cube for 463L pallets. A reduction in airlift requirements of up to 2,000 pallet positions (200 C-141A loads) is expected after all mobility units have been equipped with the new bins. A contract for design and first article testing is expected to be awarded by April 1981 with mass production starting next year's end.

**Table of Allowance  
For Office Automation**

HQ USAF recently requested HQ AFLC to establish a Table of Allowance 007, entitled "Automatic and Electronic Administrative Support Equipment and Components." This Table of Allowance (TA) for Office Automation will combine all existing automated office equipment currently published in existing TA's with new state of the art equipment items. HQ USAF/LEYS will continue to work to establish specific basis of issues (BOIs) for office equipment.

# CITA Cost Comparison: Systems Analysis Revisited

Major John W. Stone, Jr.  
Maintenance Staff Officer  
Logistics Career Broadening Program  
Sacramento Air Logistics Center  
McClellan AFB, California 95652

## Abstract

From its introduction to the Department of Defense in the early 1960's, systems analysis has been noteworthy for its growth, influence and controversy. Throughout this period, systems analysis has continued to evolve in technique and purpose. The cost comparison analysis process, dictated by OMB Circular A-76, and used to determine if selected Commercial and Industrial Type Activities (CITA) should be performed in-house or by commercial contractors, is a specific application of systems analysis, and shares many of the same advantages and pitfalls. This article compares the CITA cost comparison process with the evolving techniques and concepts of systems analysis, indicates how CITA has lagged and recommends ways to minimize current deficiencies.

## The Evolving Purpose of Analysis

Whether the name is systems analysis, cost effectiveness analysis, cost benefit analysis or cost comparison analysis, the underlying purpose of the analytical effort is to provide the executive with better information—but information for what purpose? Systems analysis in the 60's emphasized decision making, using economic and scientific criteria and methods. As Dr. Enthoven, who moved from RAND to become the Assistant Secretary of Defense (Systems Analysis) in the early 1960's characterized systems analysis: "in essence, it is a way of dealing with the basic economic problem—how best to use our limited national resources . . . the methods of science are open, explicit, verifiable and they combine logic with empirical evidence." [1:54] The environment of limited resources that provided the stimulus for rapid growth of these concepts is even more prevalent today than it was twenty years ago. With few exceptions, all DOD managers face the increasingly difficult task of doing more with less, of balancing increasing requirements with ever decreasing capabilities. The cost and effectiveness terminology have direct parallels to capability and requirements. As illustrated in Figure 1, when the equation goes out of balance, there are only a limited number of alternatives: decrease requirements, increase capability or change the standards that define the relationship. Analysis plays a central role in any of these activities.

As systems analysis evolved, however, the purpose has expanded. In the 60's, Quade characterized systems analysis as a systematic approach to helping a decision maker choose a course of action by investigating his full problem, searching out objectives and alternatives, and comparing them in the light of their consequences, using an appropriate framework—in so far as possible analytic—to bring expert judgement and intuition to bear on the problem. [2:2] Ten years later, after repeated experience with the problems systems analysis encountered in the DOD, and after exposure to the policy science discipline of Dr. Yehezkel Dror at RAND, the same author was balancing the purpose of choice with the purposes of influence and action. "The outcome to be expected from the analysis is almost never a clear recommendation for choice." [3:13] He further indicates that "the real goal of a decision-maker is not just to discover and make the right decision; it is to get that decision accepted by

others and then implemented without being vitiated." [3:33]

Thus, in the twenty years from 1960 to 1980, the nature and purpose of systems analysis have evolved from a discipline primarily concerned with choice using scientific and economic criteria, to a broader discipline emphasizing a comparison of what is (behavioral research), what is preferred (values research), what should be (normative research) and what can be (feasibility research). [4: ch 6]

## A Background of Controversy

Within the overall spectrum of systems analysis, cost effectiveness and its subset, cost comparison analysis, are specific applications that rely heavily on quantifiable economic models. As a result, these types of analysis have been most resistant to the evolutionary changes toward the broader inclusion of values and feasibility. Cost effectiveness is a form of systems analysis in which alternatives are compared in terms of two of the consequences, dollar or resources costs, and effectiveness. The effectiveness is measured by the extent to which the alternative, if implemented, will attain the desired objective. The preferred alternative is usually taken to be either the one that produces maximum effectiveness for a given level of cost or minimum cost for a given level of effectiveness. [3:25]

During CITA (Commercial and Industrial Type Activities) cost comparisons, the latter approach is used. The given level of effectiveness is defined by the requirement in the Statement of Work (SOW). Then the activity that has the lowest total cost, either contractor or in-house, is selected. However, as in cost-effectiveness, the measurement of effectiveness is almost always a problem. It must be measured on a scale that depends on the nature of the goal and that may require the use of proxies. [3:25] For example, while the goal for a vehicle operations and maintenance activity may be an effective base transportation system, this can be measured only by the translation of that goal to proxies or secondary criteria such as vehicle out of commission rates or cost per vehicle mile.

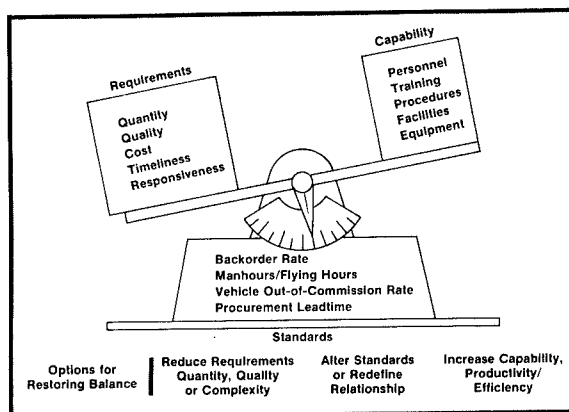


Figure 1. Management's Primary Dilemma—  
How to Retain a Balance Between Requirements and Capability

Much of the controversy surrounding cost-effectiveness stems from the problem of defining and measuring effectiveness. One source of the difficulty is the paradox of requirements relativity. In order to manage at all, in order to address the management equation of requirements and capability, we must assume a point in time, definitive requirement. However, this assumption is a pragmatic expedient, not a true reflection of the way things are. In reality, requirements are constantly changing due to variables in the environment (mission, threat, objective, technology), in ourselves (values, perceptions, goals, judgements) and in resource capability (funds, personnel strength, facilities, etc). In addition, requirements often evolve due to a genuine lack of knowledge at the outset. While this paradox is known to play havoc in major weapon system acquisition, the same is true in the CITA cost comparison, where Statements of Work attempt to define what services and products are to be furnished.

It is when the difficulties in defining and measuring requirements and other limitations of systems analysis are ignored that the tool is criticized for the damage caused by its owner's negligence. As Lt. General Ira C. Eaker, USAF (Ret.) commented, "One of the prime obstacles to adequate defense weapons and measures in recent years has been a hurdle called cost-effectiveness. This test applied by scientists and theorists has killed off many new weapons, urgently requested by military leaders. If Hitch applies cost-effectiveness to the curriculum at California, philosophy will have to go. It does not give the financial return to graduates which they can get from medicine, engineering or law. The department of education no doubt will be eliminated also. Teaching does not pay as well as dentistry." [2:17]

One might wonder why an approach that appears so logical is so violently opposed. Cost effectiveness analysis seeks to increase value received for the resources expended. It is something we all practice when buying an automobile or house. It is not the method that should be under attack. The deficiencies of cost-effectiveness or systems analysis exist only when the work is not competently done or when the results are used without their limitations in mind. [2:17] Since cost-effectiveness and cost comparison analysis have been resistant to the evolutionary broadening that has occurred in systems analysis, it is not surprising that they continue to exist in the center of controversy.

### **The Process of Analysis**

The process of analysis takes place in five overlapping stages. In the first, the formulation stage, the issues are clarified, the extent of the inquiry limited, and the elements identified. In the second, the search stage, information is gathered and alternatives generated. The third stage is evaluation, where information is examined and compared. The evaluation stage can often lead back to either formulation or search. The fourth stage is interpretation, where the relationships of assumptions made during formulation are examined against facts and criteria developed during evaluation. The final stage is verification, where expected outcomes of implemented alternatives are measured against practical experience or simulation. [3:50] A comparison of the stages of systems analysis with those of a CITA cost comparison reveal many similarities and some interesting differences.

The formulation stage for the CITA cost comparison process is standardized to a significant extent. The cost comparison model contained in the OMB Cost Comparison Handbook prescribes the elements and theoretically serves to limit the inquiry. This stage begins with the identification of the activity to be analyzed, and includes the development and

review of the statement of work. The formulation stage is concluded with the formal solicitation, a request for proposal or bid.

The search stage includes the generation of alternatives to include potential contractors and various ways of accomplishing the requirement in-house. The latter effort ends with the certification that the proposed in-house method is the most efficient and cost effective. The cost of the in-house alternative includes personnel, material, overhead, etc. In addition, during the search phase, two costs are computed that will be added to the potential contractor bids, the cost of contract administration and the cost of realigning government employees to other jobs who would be displaced if a contractor won the bid.

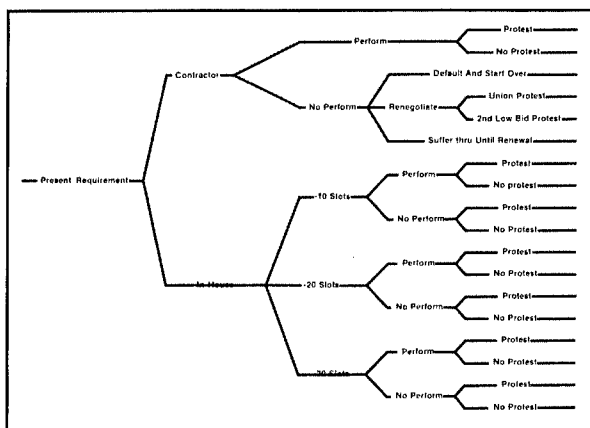
The evaluation stage includes several levels of review of the cost factors developed for both in-house and additive to contractor bids. In addition, it may include technical evaluation of contractor proposals. The evaluation is completed when both the government proposal and the best and final offers from potential contractors are submitted to the contracting officer.

The interpretation stage includes bid opening, the accumulation and comparison of the cost data, the evaluation to determine the responsive and responsible bidder, and the bid award. It is here at the interpretation stage where CITA cost comparison differs most dramatically from the broader discipline of systems analysis. In systems analysis, interpretation includes risk analysis, sensitivity analysis, resource analysis, tradeoff analysis and contingency analysis. These steps consciously relax assumptions about the environment, requirements, capability and their relationships in order to give the decision maker a full and complete perspective. It is in the interpretation stage, hinging on implicit assumptions of firm requirements and capability made during formulation, that CITA cost comparison processes are most vulnerable to error.

Assumptions play a central role throughout the analytical effort. Indeed, one function of analysis is to surface assumptions—to bring them out into the open for rational consideration. According to Dr. Enthoven, "Like operations research, this kind of analysis can and must be honest, in the sense that the quantitative factors are selected without bias, that the calculations are accurate, that alternatives are not arbitrarily suppressed, and the like. But it cannot be 'objective' in the sense of being independent of values. Value judgments are an integral part of the analysis; and it is the role of the analyst to bring to light to the policy-maker exactly how and where value judgments enter so that the latter can make his own value judgments in the light of as much relevant information as possible. [2:4] An analyst may either make his political assumptions explicit or merely imply them. Implied assumptions cause major problems because they tend to creep into and slant the work of analysts. They may have a powerful impact on recommendations, and yet go undetected. [1:101]

### **The Elements of Analysis**

The elements of analysis consist of objectives, alternatives, costs (impacts), the model and criteria. [2:12; 3:47] In defense policy in particular, and in many other cases as well, objectives are not, in fact, agreed upon. The choice, while ostensibly between alternatives, is really between objectives, and nonanalytical methods must be used for a final reconciliation of views. Although the consequences computed from the model may provide guidance in deciding which objectives to compromise, such decisions are not easily made, and judgment must in the end be applied. [2:44] During



**Figure 2. Contracting-Out  
Cost Comparison Alternatives and Consequences**

the process of CITA cost comparisons, the primary objective is to select the most cost-effective source for meeting an established requirement. However, there are conflicting secondary objectives that can be highlighted by answering the question "who prefers what and why?" from value analysis. For example, some Congressmen may have the political objective of moving jobs from the public to the private sector; prospective contractors have the objective to obtain contracts and maximize return on investment; and union leadership has the objective to retain jobs for its members.

While the cost comparison process does stress the search for alternatives, both among contractors and among various methods of in-house accomplishment, it also factors in certain risks and consequences associated with each alternative. Figure 2 illustrates a decision tree for a hypothetical contracting-out effort. Even without cost or probabilities attached, the simple listing of possibilities is educational. As more experience is gained, it should be possible to more accurately estimate costs and probabilities for each outcome and to measure the sensitivity of these factors. In questions dealing with the future, it is ordinarily futile to remove uncertainty by making a best guess, or by assuming that no uncertainty exists. It is essential to do sensitivity analysis rather than depend on "expected value" of key parameters. [2:56]

### Pitfalls and Limitations

*"The greatest derangement of the mind is to believe in something because one wishes it to be so."* — Louis Pasteur [3:304]

The analysis effort is vulnerable at each stage of the process and during the consideration of each element. However, when properly applied it offers distinct advantages over other methods. The first and perhaps most prevalent pitfall is to forfeit the advantages of the analytical method. "It is thus a serious mistake not to make any analysis and the judgments on which it depends explicit. For if they are not, we surrender the three great advantages the analytic approach has over its competitors—namely, that someone else can examine the work, can evaluate it, and can modify it as new information become available." [2:48]

In the formulation stage, two pitfalls occur while defining the requirement and objectives. These pitfalls revolve around the relationship between the decision maker and the analyst. The decision maker can ask the analyst three different questions: (1) What is the case? (2) Is my perception correct? or (3) Can you give me evidence to support my assessment?

This last question is not a charter for analysis at all, but an invitation for case building. The difficulty stems from the similarity between question 2 and question 3. Both the analyst and the decision maker must be sure they know the charter. While the use of question 1 is the widest door to knowledge and could serve to eliminate any confusion as to the charter, it gives the impression of ignorance, and is therefore rarely used. During the formulation stage, there is often a tendency to measure what a system can do rather than what it should do [2:49]; however, the new Air Force performance-oriented Statement of Work (SOW) should help to offset that tendency. Yet this pitfall is particularly difficult to overcome in CITA cost comparisons when regulatory requirements, upon which standardized statements of work are based, do not match either the required service or the existing service. When narrowing the scope of the study in the formulation and search stages, another type of pitfall can occur. Although narrowing the range of choice certainly makes the analysis easier, we may pay a high price for the labor we save if some of the excluded alternatives are better than those remaining. The most frequent cause of failure to look at the full range of alternatives is an "attention bias." This often takes the form of an unconscious adherence to a "party line" or "cherished belief." All organizations foster one to some extent. [2:51] The party line can be most influential in shaping the study during the early stages. What can happen is that the participants and successive reviewers become aware that some of the alternatives or certain assumptions being considered are frowned on by higher ranking officers. [2:52]

Two other types of pitfalls can occur during the search phase. Inflexibility in the face of evidence consists not in forming a preconceived or early idea about their solution, but in being unwilling to discard such an idea in the face of new evidence. [2:50] In addition, errors occur when the analyst fails to communicate effectively with the professional people on whom he must rely. A possible way to avoid this type of pitfall is to have someone on the analyst's team who is at least a lay expert in all important fields with which the study is concerned. [2:53] During CITA cost comparisons, the steering group, headed by the analyst, uses the in-house activity manager as a lay expert. While this is a major benefit in the review and development of the SOW, it can have counter-productive impacts if the role of the manager expands into later stages of the study, such as technical evaluation of proposals or pre-award surveys. Since the activity manager is responsible for participating in the development of the in-house bid, and has a vested interest, the ideal solution would be to have a separate lay expert assist the analyst.

During the interpretation and verification phases, the analysis is subject to the pitfalls of parochialism. It is unreasonable to expect the person or the organization that created a system to discover its faults. To appraise a system and discover its value, good analysts obligate themselves to consult people with an adverse opinion of the worth of the system. [2:53] During CITA cost comparison, this pitfall is partly alleviated by having the cost data reviewed by the Base Management and Cost Analysis Office.

Due to the relatively stringent standardization within the CITA cost comparison process, the major pitfall or limitation evident is the substitution of the model for the decision maker. If a model or a mathematical formula is used to indicate which proposal to select, as is the case in the CITA process as currently designed, the emphasis quickly shifts and focuses on how to make the bid look favorable in terms of the proxy criteria and the analytic definition, rather than on how to achieve the ultimate objective. [2:58] This type of "rule beating" or "buy-in strategy" will occur whenever the

judgment of the decision maker and the full extent of the analysis effort are short circuited by over-reliance on a model. The result is a no win situation. If the in-house group ignores the model and creates a proposal that will achieve the legitimate requirements, they will almost certainly lose the contract. If the in-house group counters an expected contractor buy-in strategy with one of their own, the government is still the long term loser, for while the in-house activity may win the contract, they will have forfeited the capability to perform the required mission.

### **Roles and Responsibility**

Many of the current difficulties being encountered in the CITA cost comparison arena can be traced to the lack of properly defined roles and responsibilities for the participants. In systems analysis, the two crucial roles are those of the decision maker and the analyst or analysis team. The CITA equivalent of the analysis team is the steering group, composed of representatives from the Management Engineering Team, the activity under study, Base Contracting, Legal, and Accounting and Finance. However, two factors limit the capability of the team. First, the members of the analysis team do not remain the same. With the exception of the Management Engineering Team member, team composition changes substantially with each new activity considered. As a result, the learning curve must be overcome with each new project. Second, team members, while theoretically expert in their own fields, do not receive any training in the general concepts and techniques of systems analysis or cost comparison analysis. Without an understanding of the analysis process the full expertise of team members can not be brought to bear on the problem.

The role of the decision maker is even more fragmented.

The on-site decision maker, and the manager who must bear the direct consequence of the decision, is the installation or organizational commander. However, the actual decision is "made" by the cost model, influenced by the model designers in OMB, and by the assumptions and criteria input at various levels of review. If the on-site decision maker is to have any impact on the accuracy of the decision, it must be in selecting, training, and reviewing the analysis team.

### **Recommendations**

Three things can be done to minimize the problems that are inherent in the current CITA Cost Comparison process. First, the role and responsibility of the on-site decision maker should be expanded to allow for explicit value judgments outside of the quantitative cost model. This would allow a complete analysis and regain the advantages of the analytical process. Second, more time and talent must be invested in the development of Statements of Work, specifically the quantitative criteria must be carefully selected to insure they support the primary mission objective in order to prevent "rule beating" strategies. Finally, since CITA Cost Comparison will continue to have major mission and fiscal impacts for the future, we must ensure these analyses are performed and reviewed by personnel trained and dedicated to the task.

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- [3] Quade, E. S. *Analysis for Public Decisions*. New York: Elsevier North Holland, 1979.
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### *Most Significant Article Award for 1980*

The Editorial Advisory Board has selected "Air Force Logistics Doctrine" by Lieutenant Colonel James D. Gorby, USAF, as the most significant article published in the *Air Force Journal of Logistics* during 1980.

### *Most Significant Article Award*

The Editorial Advisory Board has selected "A Foundation for an International Logistics Language" by Colonel Husam Abo Ghazaleh, Royal Jordanian Air Force, and Mr. Ardel E. Nelson as the most significant article in the Winter 1981 issue of the *Air Force Journal of Logistics*.

## The Mobilization Augmentee in Logistics: Using the Potential Now

Major Dennis E. Deuschl, USAFR  
*Mobilization Augmentee to Special Assistant  
DCS/Logistics and Engineering  
HQ USAF  
Washington, D.C. 20330*

In these times of budget constraints and shortages of experienced personnel, meeting Air Force wartime mission requirements and peacetime demands for increased productivity presents a real challenge. Nowhere is this challenge greater than in Air Force logistics and engineering, which in Fiscal Year 1980 represented over 50 percent of the service's manpower and one-third of its budget.

Getting the logistics job done under austere conditions has involved a variety of obvious organizational and procedural changes, including consolidation, standardization, more decision-making at the unit level, the setting of stricter priorities and expanded uses of automation. Less apparent, but with highly positive results, has been the increased

reliance on and more effective use of Mobilization Augmentees (MAs) by the active duty force.

The MA is a ready reservist assigned to an active Air Force unit/office against an individual manpower augmentation authorization established to support the period immediately following a declaration of war or national emergency, or to respond to any situation the national security requires.

The Air Force MA program often requires more self-reliance and individual initiative than the traditional unit program. In the event of mobilization, MAs will be recalled to active duty and must be prepared on short notice to perform in their wartime positions.

Most MAs in the Air Force are in Training Category B, requiring them to perform in each fiscal year 12 annual training days and at least 24 Inactive Duty Training periods (the equivalent of 12 days).

It is a mutually beneficial relationship. The Air Force gains additional manpower and expertise. The Reservists, in turn, earn pay for their service as well as points toward retirement at

**Table 1**

### Assigned Officer MAs in Logistics, Engineering & Services (As of July 30, 1980)

<i>Operating Agency/Command Name</i>	<i>*MAs With Log/Eng/Svcs AFSCs</i>	<i>Total AF MAs</i>
Alaskan Air Command	1	4
Air Force Academy	0	1
Air Defense Command	1	1
Air Forces Europe	1	3
Accounting & Finance Ctr	0	14
AF Logistics Command	208	364
AF Systems Command	62	758
Air Training Command	14	58
Air Force Reserve	15	335
Hqs U.S. Air Force	50	379
Military Airlift Command	61	256
Pacific Air Forces	32	148
Strategic Air Command	17	60
Tactical Air Command	63	166
Electronics Security Cmd	9	103
Communications Services	3	83
North American Air Defense	13	33
AF Inspection & Safety Ctr	2	5
AF Intelligence Service	2	666
Auditor General	0	95
Ofc of Spec Investigation	0	164
Military Personnel Center	1	12
Engineering Services Ctr	8	8
Service Information Center	0	13
Admin. Svcs. Support Group	1	14
Historical Research Ctr	0	8
Air Reserve Personnel Ctr	393	2953
Other AF Elements	120	166
<b>Totals:</b>	<b>1077</b>	<b>6870</b>

AFSCs included are: 0046 (Dir of Log), 31xx (Missile Mnt), 40xx (Aircraft Mnt & Munitions), 55xx (Engineering), 60xx (Transportation), 62xx (Services), 63xx (Fuels), 64xx (Supply), 65xx (Systems & Acquisitions) & 66xx (Log Plans & Programs).

Source: Personnel Division, Office of Air Force Reserve

**Table 2**

### Assigned Enlisted MAs in Logistics, Engineering & Services (As of July 30, 1980)

<i>Operating Agency/Command Name</i>	<i>*MAs With Log/Eng/Svcs AFSCs</i>	<i>Total AF MAs</i>
Air Forces Europe	19	72
AF Logistics Command	119	331
AF Systems Command	26	115
Air Training Command	1	21
Air Force Reserve	0	16
Hqs U.S. Air Force	2	10
Military Airlift Command	0	54
Pacific Air Forces	12	126
Strategic Air Command	15	186
Tactical Air Command	142	381
Electronics Security Cmd	20	228
Communications Services	2	67
North American Air Defense	0	11
AF Intelligence Service	5	239
Auditor General	0	2
Ofc of Spec Investigation	0	146
Military Personnel Center	0	1
Engineering Services Ctr	16	18
Service Information Center	0	2
Air Reserve Personnel Ctr	3	517
Other AF Elements	0	1
<b>Totals:</b>	<b>382</b>	<b>2544</b>

\*AFSCs included are: 31xxx (Missile Mnt), 40xxx (Aircraft Mnt & Munitions), 55xxx (Engineering), 60xxx (Transportation), 62xxx (Services), 63xxx (Fuels), 64xxx (Supply), 65xxx (Systems & Acquisition), 66xxx (Log Plans & Programs).

Source: Personnel Division, Office of Air Force Reserve

age 60. Besides their mandatory duty requirements, MAs may perform up to 89 additional days of active duty per fiscal year on a special tour manday basis.

Mobilization Augmentees are assigned to all functional areas and nearly all organizations at all levels. Approximately 15 percent of Air Force selected Reservists assigned as of July 30, 1980, were MAs. Of these, 1077 officers and 382 enlisted personnel were working in logistics, and engineering and services career fields, representing 15 percent of the total MA Force.

Among the various Air Force commands and operating agencies, Air Force Logistics Command ranked as the leading command with 208 officers working in logistics, and engineering and services jobs. In terms of enlisted personnel, AFLC, with 119 assigned in logistics career fields, ranked just behind Tactical Air Command (see Tables 1 and 2).

At the Headquarters USAF-level, the Deputy Chief of Staff/Logistics and Engineering (AF/LE) ranked third among the 13 Air Staff offices in terms of MAs assigned in August 1980. The AF/LE total was 56. But sheer statistics do not in themselves explain the real benefit that the Air Force logistics and engineering community receives from its MAs. More meaningful is this profile of MAs assigned to AF/LE in August 1980:

- The breakout of MAs assigned by AF/LE directorate was: 19 in Logistics Plans and Programs, 14 in Transportation, 11 in Maintenance and Supply, 7 on the immediate staff of the DCS/L&E, and 5 in Engineering.

- The MAs hailed from 16 states and the District of Columbia. Significantly, 60 percent lived within a 50-mile radius of Washington, D.C., enabling them to report rapidly for duty should a recall occur. Their employers were about evenly divided between the government and private industry sectors, although several MAs served in the education field and one was a student.

- The division of MAs by grade was as follows: 1 general officer, 33 field grade officers, 19 company grade officers, and 3 senior enlisted personnel.

- A wide range of civilian occupations was represented among the AF/LE MAs. Twenty-one held various managerial positions, eight were computer executives and four were program analysts. The balance included such vocational titles as realtor, engineer, chemist, insurance underwriter and securities analyst.

- Most impressive of all was the high educational level of the AF/LE MAs. Thirty, or more than 50 percent, possessed master's degrees.

### Individual MA Contributions

Obviously, the AF/LE MAs look good on paper, but do they produce for the Air Force when they perform their active duty service? The best indications of this are the remarks made by the active duty supervisors of some of the AF/LE Reservists.

ITEM: *Capt Kent A. Denton, Vincenttown, N.J., Mgr., Distribution & Transportation Safety, FMC Corporation, MBA degree.*

"His working knowledge in this area has provided the staff expertise not otherwise available. During his recent tour Captain Denton organized an approach requesting an exemption to authorize the transportation of Pilot's Life Support systems (containing class C explosives) overpacked in an aerial delivery bag as passengers checked baggage on commercial passenger aircraft. Hopefully the approach outlined by Captain Denton will bring this petition before the International Air Transport Association with a favorable termination." - *Lt Col Stephen W. Rohrbough, AF/LETT.*

ITEM: *Capt Richard H. Harris, Jr., of Harrisburg, PA, Assistant Highway Maintenance Manager, Commonwealth of Pennsylvania, MBA degree.*

"During his recent tour, Captain Harris served as Transportation Officer, Contingency Support Staff (CSS) in the Air Force Emergency Operations Center at Ft Ritchie, Md., for exercise PRIZE GAUNTLET 80. He was fully proficient in his position, was able to monitor the aerial port status and advise the Joint Chiefs of Staff of problems as required, kept a detailed log of events and on his own initiative developed a guidebook for his CSS position. This 'smart' book includes time-phased duties, simulated messages, a list of contacts and a list of publications required. His tour not only relieved a regular officer from this duty but will make it easier on the next officer to serve in that position." - *Lt Col Richard A. Meyer, AF/LETX.*

ITEM: *Capt (Major Selectee) Robert M. Glaze, of Alexandria, VA, Program Analyst (GS-14), Defense Advanced Research Projects Agency, MBA degree.*

"Capt Glaze displayed exceptional talent and outstanding fiscal programming and budgeting knowledge in his work with the Electronics and Telecommunications FY 82 Acquisition Program. He was put on his own to document FY 82 budget requests for 11 programs totaling over \$65 million. His work passed careful scrutiny at senior Air Force review levels." - *Ms Beverly Hooper, GS-15, AF/LEXP.*

ITEM: *Capt David R. Hall, of Asbury Park, N.J., Software Systems Analyst, MITRE Corporation, MS degree.*

"Capt Hall designed and implemented the Materiel Readiness Forecast System (MRFS), an interactive computer program which generates aircraft mission capability data for the Material Readiness Report to Congress. The system allows a user to enter data by mission-design-series (MDS), generates mission capable forecasts based on data entered, permits logistics analysts to edit the forecast data, and produces a report for each MDS, suitable for inclusion in the annual Material Readiness Report to Congress." - *Lt Col Robert L. Sims, AF/LEXY.*

ITEM: *Capt Drew R. Beckley, of Baltimore, Md., Financial Manager, McCormick and Co., Master's of Professional Accountancy.*

"Capt Beckley drafted and staffed a new regulation on Contractor Logistics Support (CLS). It outlines the policies to be followed during the acquisition process and responsibilities of major participants in the consideration and selection of CLS as a possible alternative to organically-based logistics support. During the course of preparation and staffing of this important new policy, Capt Beckley met with major command representatives. He also met with representatives from industry and received comments from several industry associations. The regulation is expected to be published soon." - *Lt Col Bruce W. Ewing, AF/LEYE.*

ITEM: *Lt Col William A. Whittington, of Lisbon, Md., Supervisory Environmental Engineer (GS-15), US Environmental Protection Agency, MS degree in civil engineering.*

"Lt Col Whittington recently upgraded the requirements for Spill Prevention, Control and Countermeasure, and Oil and Hazardous Substances Pollution Contingency plans. He also determined specific requirements for the handling and disposal of Polychlorinated Biphenyls (PCBs) and coordinated the procedural implementation of the Resource Conservation and Recovery Act and the Toxic Substances Control Act." - *Lt Col John J. Coughlin, AF/LEEV.*

Continued on page 18

## Operation Planning In Perspective

Major Charles M. Leigh  
Logistics Plans Directorate  
Air Force Logistics Management Center  
Gunter AFS, Alabama 36114

Despite the significant importance of operation planning throughout the Department of Defense, planners still face numerous problems in developing effective operation plans. The most serious problems may stem not only from deficiencies in the planning system but also from a lack of understanding about the system on the part of functional area managers who are expected to insure, in their areas of expertise, that plans are comprehensive and address salient issues required to support combat forces. Education in the overall planning system of anyone making such an important contribution must receive attention by planners at every level in the Air Force. This article is written toward that end. Its purpose is twofold: First, to provide an understanding of the operation planning process and its role in the "big picture" of DOD planning and programming activities; second, to provide an overview of significant problem areas and a discussion of current efforts to improve operation planning as it relates to preparedness for contingency operations and rapid deployments.

### Overview of the Major Planning Systems

The Joint Operation Planning System (JOPS) is closely related to both the DOD Planning, Programming, and Budgeting System (PPBS) and the Joint Strategic Planning System (JSPS) used by the Joint Chiefs of Staff (see Figure 1). The process begins when the Joint Chiefs of Staff initiate planning in support of the annual PPBS cycle. The Joint Chiefs use the Joint Strategic Planning System to provide the intelligence, strategy, and force planning guidance necessary to determine the service force requirements which, in turn, lead to budget development.

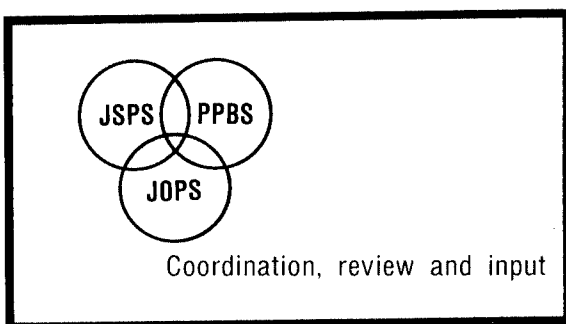


Figure 1. The JSPS, PPBS, and JOPS Interrelationship

This system also provides guidance to the unified and specified commanders\* for developing operation plans for potential conflicts. The operation plans, in turn, provide requirements feedback for planning and programming during the PPBS cycle.

### The PPBS

The Planning, Programming, and Budgeting System establishes the military force levels and provides the personnel, equipment, and materiel required for the military to

function as an effective instrument of national policy. This system integrates national policy objectives with current and programmed military capabilities and provides basic guidance for the military departments to develop their annual budgets. The PPBS cycle begins with the planning by the Joint Chiefs in the Joint Strategic Planning System. The Joint Chiefs use this system to translate national security policy into guidance needed by the services for force structuring and operation planning.

### The JSPS

The Joint Chiefs of Staff use a number of documents in the Joint Strategic Planning System (JSPS) to provide estimates of the forces necessary to meet national security objectives. Figure 2 shows the principal documents used in the JSPS process and the relationship between the Joint Strategic Planning System, the Planning, Programming, and Budgeting System, and operation planning. The JSPS process begins with estimates of the threat. The intelligence documents of the JSPS such as the Joint Intelligence Estimate for Planning, address specific threats (e.g., the Soviets or other "enemies") and geographic areas (e.g., the Persian Gulf) and provide the basis for annual preparation of the Joint Strategic Planning Document (JSPD), which provides advice to the President, the National Security Council, and the Secretary of Defense on the military strategy and force levels necessary to attain national security objectives in the mid-range period (from 2 to 10 years in the future). The Joint Strategic Planning Document initiates the PPBS cycle and provides information used by the Secretary of Defense in preparation of the Consolidated Guidance (CG) document.

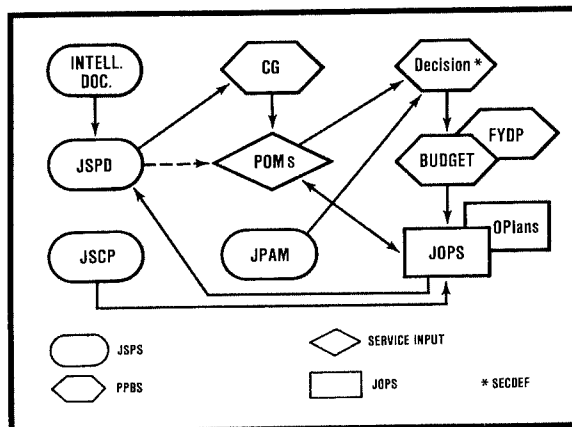


Figure 2. Relation and Direction of Information Flow (Direct and Indirect) Between the JSPS, PPBS, and JOPS.

The Joint Chiefs, in turn, prepare the Joint Program Assessment Memorandum (JPAM). This memorandum is prepared annually to provide the Secretary of Defense with an assessment of the balance and risks associated with the force levels of the combined service Program Objective Memoranda

\*As used subsequently in this article, the term unified commands also includes specified commands and, as appropriate, the Rapid Deployment Joint Task Force.



(POMs). The JPAM is based on the JSPD, the CG, the force levels programmed in the Five Year Defense Program, and inputs from the services.

The final document prepared in the JSPS cycle is the Joint Strategic Capabilities Plan (JSCP). This plan is a tasking directive that initiates the operation planning process at unified and command levels. Specifically, it directs the development of operation plans using the forces available in the first year of the FYDP. Thus, the Joint Strategic Capabilities Plan "ties" operation planning to the Joint Strategic Planning System and the Planning, Programming, and Budgeting System and establishes the military tasks which support the approved national strategy and security objectives. The Joint Strategic Capabilities Plan also provides guidance on forces, logistics, and intelligence for use by joint and specified commanders.

### **The System Processes in Detail**

#### **The PPBS Process**

The planning process of the PPBS ends when the Joint Chiefs of Staff submit the JSPD to the Secretary of Defense. The Secretary, in turn, issues the CG which provides guidance thru the Joint Chiefs to the services and defense agencies for programming. The services develop their Program Objective Memoranda (POMs) and submit them to the Secretary of Defense for review, approval, and subsequent budget action. The Joint Chiefs, in turn, review the Consolidated Guidance document and the service POMs to insure that adequate forces and support are programmed to meet national security objectives. The results of the JCS review are published in the Joint Program Assessment Memorandum. The Secretary of Defense reviews the service POMs and the Joint Program Assessment Memorandum and issues Program Decision Memoranda (PDMs) which finalize the service POMs and set the stage for development of the service and DOD budgets. The completion of the PPBS cycle results in the presidential budget, which is submitted to Congress in January, and also updates the Five Year Defense Program.

#### **The Operation Planning System**

The Consolidated Guidance provides planning, programming, and fiscal guidance and the Planning, Programming, and Budgeting System, through the budget process, provides the services with the resources necessary to achieve national security objectives. Operation planning is the next logical step for translating military capability into preparedness for potential contingencies. The operation planning system, known more specifically as the Joint Operation Planning System (JOPS), provides the vehicle for addressing national security objectives in terms of forces, strategy, and support required to employ the military as an instrument of national policy.

Operation planning is primarily the function of the unified commanders in response to guidance provided in the Joint Strategic Capabilities Plan (JSCP). This plan tasks the unified commanders to develop operation plans that support specific potential national security contingencies ("operation plans" include all contingency plans except the SIOP). The Joint Chiefs of Staff provide the unified commanders with general and administrative guidance via the Unified Command Plan, the Joint Operation Planning Systems Manual, and JCS publications 2 and 6.

#### **JOPS in Detail**

The Joint Operation Planning System is the basis for the development of operation plans (sometimes known as

OPPlans) within the Department of Defense. The JOPS requires a common approach to insure maximum standardization of the operation planning process. It provides the means of translating national security objectives tasked in the Joint Strategic Capabilities Plan into workable military plans to achieve those objectives.

Operation planning is a highly complex process of seven major steps. Its complexity stems from the number of major steps, the sub-processes involved in each step, and the enormous amount of data required to produce an operation plan. However, an understanding of the process is extremely important to defense managers at all levels because operation planning not only insures military preparedness to meet contingencies but also plays an important role in the programming and budgeting process.

The seven major phases of operation planning are:

##### *Initiation*

##### *Concept Development*

##### *Plan Development*

##### *Plan Review*

##### *Supporting Plan Development*

##### *Execution Planning*

##### *Execution*

##### *The Initiation Phase*

The initiation or tasking phase begins with a statement of national security objectives, an assessment of the threat, and an evaluation of planning tasks and available forces. This phase requires action at three levels: Joint Chiefs of Staff, unified command, and service. At the JCS level, the initiation phase includes development of the Joint Strategic Capabilities Plan, which tasks the unified commanders to produce specific operation plans. The tasked unified commanders, in turn, analyze the JSCP tasking and other JCS guidance, review the threat, and analyze their capabilities in coordination with their service components. The services provide their subordinate commands (service components of the unified commands) with doctrine and guidance; combat, support, and replacement forces available for planning; and planning factors for logistics support.

After preliminary assessment at the unified command level, the service components and unified commands provide comments and recommendations on the JSCP tasking, guidance, threat, and capabilities. The service components provide their recommendations through both unified and service channels, whereas the unified commands report the JCS. This process resolves planning problems by redefining tasking (if appropriate), and lays the groundwork for the concept development phase.

##### *The Concept Development Phase*

The concept development phase is a primary function of the unified command. The objective in this phase is to develop the "best" approach or concept of operations to satisfy the tasking for an operation plan. On the basis of service component inputs and political, threat, and logistics assessments, the unified commander develops estimates of the forces, support, and strategy needed to satisfy the tasking. These estimates form the basis for the commander's assessment and the concept of operations. The concept of operations also assigns tasks to subordinate commanders, identifies objectives and timing, and coordinates requirements and objectives with the overall operation. The concept development phase provides the skeleton for operation planning and identifies the forces, support, and deployment and employment schedules required in plan development.

### *The Plan Development Phase*

The next phase in the operation planning process is plan development, the real "meat and potatoes" of the Joint Operation Planning System. This is the point where planning guidance, estimates, and assessments join to form a broadly useful document. This phase includes several critical steps to insure proper development of an effective operation plan. The service components play key roles in this phase by providing the data necessary for developing the unified command plan.

*Force planning.* This step is based on mission analysis, threat assessment, and support requirements. This process establishes the force list that identifies the requirements for combat and support forces. The list is finalized on the basis of force availability and resolution of shortfalls.

*Deployment planning.* The next step is the time-phasing of deployment forces shown in the force list. This process matches the times availability of the forces with their required in-place time reflected in the force list. The final product of this matching process is the Time-Phased Force Deployment List (TPFDL), which, in turn, initiates building of the Time-Phased Force Deployment Data (TPFDD) base.

*Support planning.* The third step in plan development is support planning. At this point, the functional area manager plays a critical role in aiding development and verification of the support required for a comprehensive and feasible plan. In this step, the service components determine support requirements and time-phasing needed to meet projected consumption rates. This time-phasing is crucial: resupply must be timely to insure continued combat capability, and transportation requirements must compete with forces for limited transportation assets. The support requirements are included in the TPFDD for use in developing the overall transportation requirements and for conducting subsequent transportation feasibility analyses. The support requirements are fed back through service administrative channels for programming and budgeting.

*Civil Engineering and medical support planning.* The fourth step in plan development is civil engineering and medical support planning. This step includes identification of requirements for base facilities and, collaterally, civil engineering personnel, equipment, and materiel needed to support the plan. Medical planning identifies overall medical requirements and assesses medical supportability of the plan.

*Transportation planning.* The next and, perhaps most difficult step is transportation planning. Earlier steps in the planning process identified transportation requirements for forces in the TPFDL and support in the TPFDD. Transportation planning includes determining requirements for transportation support (tactical transportation and port augmentation) and analyzing transportation capabilities. The Transportation Operating Agencies (TOAs) develop strategic transportation plans in coordination with the supported unified commander. The unified commander is responsible for reordering priorities to reduce or eliminate any transportation shortfalls or for notifying the Joint Chiefs of Staff of unresolved shortfalls.

*Shortfall identification, reporting, and resolution.* A searching review of all previous planning steps and data is necessary to identify and resolve shortfalls. Shortfalls of the service component are addressed in both service and unified command channels. Shortfalls may be resolved by altering force levels and force closure times or by reallocating excess capability from one area to another. The unified commander reports shortfalls that remain unresolved to the Joint Chiefs of Staff.

*Plan documentation and submission.* The final step in plan development is plan documentation and submission. This

phase includes production of the actual "hard copy" plan with supporting annexes. After the TPFDD (computer data base) is finalized, arranged in the prescribed format, and given a final revision and update, the plan is forwarded to the Joint Chiefs of Staff for review and approval. The unified command provides subordinate and other supporting commands with preliminary guidance and, normally, draft copies of the unified plan to permit preliminary development of supporting plans.

### *The Plan Review Phase*

The plan review phase of the operation planning process is the point at which the Joint Chiefs of Staff review all elements of the unified commander's plan for adequacy, feasibility, and suitability. The Joint Chiefs coordinate the draft plan with the services, the Transportation Operating Agencies, and other supporting commands. Upon receipt of the review comments and recommendations, the Joint Chiefs either approve the plan, approve it with required substantive changes, or approve it in concept but return it for further planning. The review process is programmed to be complete within 60 days of receipt by the Joint Chiefs.

Following approval, the plan becomes effective for execution, and the unified commander becomes responsible for maintaining it in a current status. Additionally, the Transportation Operating Agencies prepare movement tables to support movement requirements outline in the plan. When the TOAs complete the movement tables, the supported unified command receives filled and unfilled movement requirements, takes action to resolve unsatisfied requirements, and advises the Joint Chiefs, the TOAs, and supporting commands of its actions. Because of the long lead times required for preparing the plan and building the movement tables, the TOAs normally begin preliminary planning upon receipt of the unified command plan prior to the Joint Chiefs approval.

Changes in the status of the basic planning criteria require a complete reassessment of the plan and an update or revision, as required. Normally, in the absence of substantive changes in the planning criteria, the unified commander updates the plan annually on receipt of the revised Joint Strategic Capabilities Plan.

### *The Supporting Plan Development Phase*

This phase follows JCS approval of the unified command plan. In the joint operation planning process, supporting plans appear to follow approval of the unified command plan. However, formulation of supporting plans often precedes development of the unified command plan. This occurs because much of the data has already been developed in support of the unified command plan. Nevertheless, the procedures and steps involved in producing supporting plans mirror the steps used in developing the unified command plan. Supporting plans produce the data to be input into the unified command TPFDD base. Service component transportation planning is limited to determination of requirements and limited tactical transportation planning and feasibility analysis. The reason for this limited transportation planning is that the Joint Chiefs control strategic transportation assets. Therefore, transportation feasibility analysis can only be accomplished at unified command or higher level, since all service components compete for available transportation assets.

In development of the supporting plans, the service components receive guidance from both the unified command and the respective service headquarters. The unified command provides the concept of operations and the planning directive, and the service headquarters provides doctrinal,

combat force employment, and support planning guidance. For Air Force components, Joint Operation Planning Process, Vols 1 and 2, and AFR 28-3, USAF Operation Planning Process, provide the basic administrative guidance for planning, and the USAF War and Mobilization Plan (WMP) contains guidance on doctrine, support, force availability, and consumption factors.

#### *The Execution Planning Phase*

Execution planning is the process of reviewing, updating, and expanding the detail of the unified command plan in light of conditions that actually exist at the onset of a contingency. Each step of the original planning sequence must be reaccomplished to, as necessary, incorporate changes in planning criteria and the concept of operations. Force, support, transportation, and other requirements listed in the original plan are reviewed, expanded in detail, and updated by both unified command and service component planners as dictated by existing contingency conditions.

Rapid response requirements and the huge quantities of data required for OPlan execution have resulted in a growing trend to incorporate more and more detailed execution type planning in development of the basic OPlan. As this trend continues, the military manager (planner or functional area manager) must become increasingly more familiar with the planning process.

#### *The Execution Phase*

The execution or implementation phase is the final step in operation planning. It begins with the decision by the National Command Authority (NCA) to use military force. Execution commences when the NCA informs the Joint Chiefs of the execution decision. The Joint Chiefs, in turn, direct the unified supported commanders and the supporting command/agencies to execute the OPlan. Upon execution and with the addition of the updated data, the OPlan becomes an operation order (OPORD). The entire contingency situation, including changes in requirements or conditions, is closely monitored at all authority levels.

#### **Current Improvement Efforts**

The foregoing description of the operation planning process has necessarily been cursory; however, the underlying complexity and finite level of detail inherent to the system must be realized. It is this complexity and detail that virtually guarantees the existence of problems which must be recognized and corrected. In this process, due to the broad nature and number of agencies involved, an often piecemeal approach to problem solution results. Continued improvements in the operation planning process and its natural consequence—deployment planning—are absolutely essential. Aside from the lack of a single DOD-wide manager and the extremely limited cadre of JOPS experienced personnel (see Faessler, *Air Force Journal of Logistics*, Vol IV, No. 2, Spring 1980), the most significant currently recognized deficiencies are inherent to the system itself. These deficiencies fall into three broad, yet closely interrelated, areas—planning guidance, transportation issues, and execution planning.

In the area of joint planning guidance, late and insufficient guidance has been a continuing problem. Delayed publication of the JSPS documents, notably the Joint Strategic Capabilities Plan, has either slowed the development of plans or compressed the time available for developing plans. Recent JCS efforts have improved the timeliness and accuracy of the JSPS documents, significantly improving joint planning. Additionally, the recent release of the JOPS III revised

computer software promises to improve the capability of the JOPS computer programs. Continued improvement efforts by the joint planning community, such as the annual JOPS Users Conference enhance cross-fertilization and should provide substantial benefits.

In the USAF planning guidance arena, significant problems exist in areas such as consumption (resupply) factors for use in JOPS, materiel attrition, and the data requirements for mobility (execution) planning. The Air Force has placed considerable emphasis in this area. Specific efforts currently underway include Air Staff, AFLC, and Air Force Logistics Management Center involvement in a study to review and update JOPS resupply planning factors with a goal of initial project completion in 1981 with subsequent follow-on projects. Improvement of these factors will not only impact basic OPlan development but also transportation and execution planning efforts both within and outside the Air Force. In the area of materiel attrition, the Air Staff's Logistics Plans Division (AF/LEXX) is the focal point for an ongoing study which, when complete, will play a key role in sizing requirements for deployments and will provide substantially more accurate data for transportation planning and analysis. The lack of accurate basic data for mobility (execution) operations has been a prominent problem at all levels from unit through service components up to theater CINC. AFSDC has placed substantial effort on developing an improved data system to provide both accurate and timely mobility capability and requirements data. This system, known as the Contingency Operations/Mobility Planning and Execution System (COMPES), is coming to fruition and is viewed with great expectations by both USAF and joint planners. The Joint Deployment Agency (JDA) views COMPES as a valuable tool to provide accurate and timely AF data for contingency planning. (See Anderson, *Air Force Journal of Logistics*, Vol V, No. 1, Winter 1981).

Transportation issues have been a critical problem area that became widely recognized as a result of Exercise Nifty Nugget 78 and the Operations Plan Package Appraisals (OPPA) I and II. The major transportation shortfalls identified in Nifty Nugget ultimately led to the establishment of the JDA.

The JOPS has an excellent capability for assessing strategic transportation requirements and capabilities; that is, the movement of forces and support between CONUS and the various theaters of operation. However, transportation analyses did not address the requirements and capabilities of getting forces to ports of embarkation or from ports of debarkation to the employment locations. With the establishment of JDA, the problems associated with moving deploying forces, equipment, and supplies, from CONUS bases to the ports of embarkation are being actively pursued. The initial efforts included development of a Joint Deployment System (JDS), and a TPFDD refinement conference for CINCEUR OPlan 4102 in May 1980. Continuing efforts in this vein will include refinement and validation of transportation requirements as well as a larger effort involving the review and refinement of all major OPlans. These efforts coupled with internal USAF actions (COMPES, JOPS resupply, etc.) hold promise for substantial improvements in execution planning.

Despite these noteworthy improvement efforts, significant problem areas impacting both operation planning and war fighting capability still exist and require added attention and resolution. Examples of such areas include intra-theater transportation planning/analysis; increased logistics "play" in long range planning; definition, budgeting, and acquisition of other War Reserve Materiels (OWRM) to fully cover the period from initiation of hostilities until industrial production can equal wartime demand. Actions in these areas are underway; however, considerably more emphasis is required.

The previously discussed "piecemeal" approach to resolving operation planning problems is a potentially fruitful area for increased emphasis. The current approach, where many disparate agencies have a "piece of the action," may not be the wisest tack. Perhaps the answer rests with the establishment of an adjunct to JCS closely akin to AF Combat Operations Staffs (e.g., TACOPS, PACOPS, and AFCOS). This "agency" would transcend service or agency parochialisms, act as a central focal point and DOD manager for operation planning, and have "real" authority to resolve issues. The creation of the JDA was a step in this direction but is primarily limited to the CONUS side of deployment planning and, thus, has limited authority to resolve all current issues.

Since operation planning is a critical element of defense budgeting and readiness, all defense managers, planners, and functional area managers have an inherent responsibility to thoroughly understand the operation planning process. As Lt Gen Billy M. Minter, Deputy Chief of Staff for Logistics and Engineering, Headquarters USAF, indicated to many of the

logisticians attending Air Command and Staff College last year, knowledge of operation planning, particularly the Joint Operation Planning System, is a critical requirement for all defense managers and is probably the least understood.

Recent events in Iran and Afghanistan, increased public awareness of defense issues, and creation of the Rapid Deployment Joint Task Force all point to the need for defense managers to increase their knowledge of operation planning and its relationship to the entire PPBS. Without a thorough knowledge of operation planning, defense managers cannot develop efficient, effective combat systems nor accurately forecast military requirements. Similarly, without accurate forecasts, Congress cannot and will not appropriate for the necessary resources.

The childhood tale of the kingdom lost for the want of a horseshoe nail serves as a potent admonition to defense managers. This country depends on the ability of the military to articulate its capabilities and requirements—an impossible task without a thorough knowledge of operation planning.

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Mobilization Augmentee continued from page 13

*ITEM: Finally, Col Peter B. Smith, Deputy Chief of the Combat Logistics Division, AF Combat Operations Staff, had this to say about the important role AF/LE MAs have played during Pentagon exercises.*

"Beginning with Exercise NIFTY NUGGET in October 1978, AF/LE has been utilizing MAs to man the Air Force Logistics Readiness Center (LRC) at the Pentagon during all JCS-sponsored command post exercises. Working side-by-side with their active-duty counterparts, these Reservists have made significant contributions to the ability of the logistics community to respond to crisis and contingency tasking. MAs with expertise in logistics plans, maintenance, munitions, supply and fuels have provided active-duty personnel with the benefit of their logistics experience while receiving valuable training for their mobilization roles."

The depth of talent apparent in the AF/LE MAs may not be entirely typical of all Air Force Reservists working in logistics and engineering. However, AF/LE's positive experience with its Reservists is indicative of the valuable contributions that most MAs are making to Air Force logistics and engineering.

Overall, the Air Force MA program is receiving increased emphasis from topside. The first comprehensive inspection and review of the program's management during 1980 resulted in the approval of nearly 1000 additional authorizations in FY 81—including 13 more engineering slots for AF/LE.

The review reaffirmed the need for qualified MAs to augment active force organizations in wartime. It also concluded that MA programs can be made even more effective. Toward this end, the Air Force has clarified training guidance, improved base-level support and established a working group to oversee the program.

In his 30 August 1980 letter to commanders of all Air Force major commands and separate operating agencies on the future of the MA program, Air Force Vice Chief of Staff General Robert C. Mathis asked them to "ensure supervisors understand their responsibility to train MAs in their wartime skills."

"Equally important," noted General Mathis, "commanders must ensure contingency plans include provisions for mobilization and utilization of MAs. The MA provides a cost-effective answer to selected wartime requirements, and I solicit your personal support to ensure that this growing program provides wartime augmentation that is required, mission ready and immediately available."

Reservists are being given the opportunities to blend their civilian expertise with their active duty roles, and their military supervisors are giving them increased responsibilities, wartime readiness training, and challenging assignments. The bottom line is that Air Force-wide logistics and engineering functions remain as productive as ever with some significant help from nearly 1,500 dedicated and wartime ready Reservists in MA positions.



## CAREER AND PERSONNEL INFORMATION

### Air Force Logistics Experience Requirements at the 0-6 Level

*Where are the senior executive positions for logisticians?*

To answer this question, let's look at colonel authorizations. Approximately 30 percent of the total colonel authorizations require logistics or logistics related AFSCs: 40XX, 66XX, 64XX, 009X, 004X, 27XX, 28XX, 29XX, 65XX, 30XX. These cover a wide range of duties such as Deputy Commander for Maintenance at the wing level, Deputy Director at HQ USAF, Systems Program Director, and joint service positions both overseas and in the CONUS. Specifically: 87% are CONUS positions (18% of those are in the Washington DC area). By command/agency, the percentages are as follows:

AFSC: 27%; AFLC: 11%; MAC: 7%; SAC: 9%; TAC: 7%; USAFE: 4%; PACAF: 2%; AFCC: 5%; HQ USAF: 8%; AFELM (including JCS, DLA, DNA, AAFES, PACOM, EUCOM, etc.): 12%; other: 8%.

A large percentage of the positions are in the joint arena, AFLC and AFSC. These represent the most attractive positions for career logisticians. At the executive level, both AFLC and AFSC provide the greatest opportunity for the logistician to bring his training, education and experience to bear on the heart of Air Force logistics.

To really focus maximum talent and experience in these areas, a prior staff tour is a strong plus. In particular, Air Staff experience greatly increases an officer's chance to be eligible for the really big jobs aspired to by many logisticians. Arriving at the grade of colonel with good staff experience will enhance employability in challenging and productive positions.

Also, in career planning to obtain one of these positions, an officer should consider his overseas eligibility. Planning for your turn overseas prior to selection for promotion to colonel will allow you to be ready to move to one of the positions. Since 13% of our colonel authorizations are overseas, some will have to go overseas. However, good career planning, coupled with outstanding performance and potential, can help position you for a good job in AFLC, AFSC or the joint arena.

For example, in AFLC, supply, maintenance and logistics plans experience are needed at the Air Logistics Centers. Maintenance officers should look forward to a division job such as Aircraft Division, Resources Management Division, Quality Assurance Division, or Engine Division (San Antonio and Oklahoma City only). Supply and Log Plans officers should plan on a position in the Directorate of Materiel Management such as: Item Management Division, Resources Management Division, Acquisition/Systems Management Division. Also, HQ AFLC offers parallel positions in the DCS Maintenance and DCS Logistics Operations.

In summary, logistics and logistics related skills are needed at the colonel level. Key executive level opportunities exist in all commands/agencies. A majority are concentrated in the front end (AFSC), wholesale level (AFLC), and joint arena. Staff experience and good career planning are essential for full use of our personnel resources to meet the needs of Air Force logistics requirements.

*(Major B. E. Rooney, Assistant Chief, Management Division, Assistant for Colonel Assignments, AFMPC/MPCOD, AV 487-6951)*

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## **The Role of Competition in Contracting for Air Freight Movement Within the Domestic Market**

Major Roland A. Hassebrock, USAF  
*Chief, Procedures Branch*  
*Directorate of Contracting and Acquisition*  
*DCS/Logistics*  
*Military Airlift Command*  
*Scott AFB, Illinois 62225*

Squadron Leader Mahboob Khan  
*Air Headquarters*  
*Peshawar, Pakistan*

Captain John R. Forster, USA  
*Assistant Professor of Military Science*  
*4th ROTC Senior Instructor Group*  
*University of San Francisco*  
*San Francisco, California 94117*

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### **The Domestic Military Air Freight Dilemma**

Since 1952, DOD has coupled the acquisition of its domestic and international supplemental airlift requirements with the establishment of a Civil Reserve Air Fleet (CRAF) under contract to meet both DOD peacetime and emergency airlift requirements [1:1]. The Civil Reserve Air Fleet is an integral part of the National Transportation Plan's standby programs and procedures for emergencies. Established by Executive Order No. 10999 in 1952, the plan requires the Office of Emergency Transportation of the Department of Transportation to allocate to the Department of Defense (DOD) specific aircraft, with designated capabilities, for use in direct support of the military airlift needs. The DOD, working with the nation's airlines, arranges for a contractual release of the CRAF aircraft for emergency service. To help develop the program, military airlift contracts are awarded only to those civil airlines that are members of CRAF. The civil carriers are thus encouraged to procure modern aircraft suitable for military use in emergencies [2:513].

Prior to 1961 a number of different contract methods were attempted which endeavored to incorporate CRAF requirements and varying forms of negotiation and competition. Many problems occurred during the period between 1952 and 1961. Before 1961, the competitive bidding; i.e., award to the lowest bidder, method was used. This method was said to place pressure on the supplemental carriers, which were then small businesses heavily dependent on military revenues, to enter bids below cost in order to avoid idle capacity [3:3]. Following a disastrous airline crash in 1961 near Richmond, Virginia, in which seventy-four Army recruits died, a number of voices questioned the competitive award of transport contracts. This was one of several accidents involving the supplementals which led Najeeb E. Halaby, then head of the Federal Aviation Administration, to voice concern at a dangerous trend. Investigations by the Civil Aeronautics Board (CAB) and a House Armed Services subcommittee disclosed that the supplemental industry was in questionable condition. The CAB concluded, for example, that the flight crew in the Richmond crash was "not capable of performing the function assigned to it" and that the company's maintenance practices were "substandard" [4:108]. Congressman Walter, a senior Democrat from Pennsylvania and Representative for many of the recruits killed in the crash, reinforced this view. Reporting on his own investigation of the supplementals, he concluded that many of them were marginal and nearly bankrupt [4:108]. These were not the only voices raised concerning what was viewed as destructive competition. Hearings held the previous year before the subcommittee on National Military Airlift of the House Armed

Services Committee brought criticism from the airline industry itself. Most industry witnesses agreed with the subcommittee that the competitive bidding system then in use had caused military tariff rates to fall to levels that threatened an imminent decline in air safety [4:213].

As a result of Congressional interest and criticism, the CAB finally took action to resolve the apparent shortcomings of the competitive environment. The CAB chose to regulate the supplemental air freight industry through the establishment of minimum rates. The setting of minimum rates by the Board at a level which guaranteed a return on investment to carriers operating at or near, industry-wide average costs, was thought necessary to eliminate the possibility that competitive pressures could cause uneconomic bidding by carriers reliant on military contracts. The Board computed the rate on a unit-per-mile basis by averaging the costs attributed by the Military Airlift Command (MAC) carriers to military transportation with an adjustment for cost changes anticipated during the current term, and adding an after-tax return on investment (10.5 percent in 1979) [3:3].

By establishing these minimum rates, price was no longer a basis for the award of contracts.

It is permitted to depart from allocation by price under 10 U.S.C. 2304(a)(16) . . . after making a determination that "it is in the interest of the national defense to have . . . a supplier available for furnishing . . . services in case of national emergency" [5:5].

This supported two of the recommendations made by a committee appointed by the Secretary of the Air Force in 1958, who had, among other issues, reviewed the Military Air Transport Service (MATS), forerunner to what is now referred to as MAC, responsibilities. CRAF-related committee recommendations included:

1. MATS procurement policy should require all commercial augmentation to be procured at Civil Aeronautics Board tariff rates.

2. Carrier should be committed to CRAF to receive peacetime business [6:11].

Since 1961, MAC has paid for services rendered by the CRAF airlift carriers in accordance with rates established by the Civil Aeronautics Board. CRAF airlift award procedures have been derived by applying a formula which determines the mobilization value of each type of CRAF aircraft. The formula for international movement provides a basis for evaluation of the cube weight, speed, and range characteristics of each type of CRAF airlift offered against a common denominator [1:4]. For example, if the Boeing 707 were used as the common denominator, the calculations for the mobilization value (MV) of a cargo aircraft for MAC International CRAF would be:

Equation

$$(1) \text{ weight factor (WF)} = \frac{\text{payload of particular aircraft}}{\text{payload of 707}}$$

$$(2) \text{ cube factor (CF)} = \frac{\text{cube of particular aircraft}}{\text{cube of 707}}$$

$$(3) \text{ speed factor (SF)} = \frac{\text{block speed of particular aircraft}}{\text{block speed of 707}}$$

convertible aircraft incentive factor (IF) = 100%

freighter aircraft IF = 80%

passenger aircraft IF = 40%

$$(4) \text{ payload factor (PF)} = \sqrt[3]{\text{CF} \times \text{WF}}$$

$$(5) \text{ MV} = \text{PF} \times \text{SF} \times \text{IF} \times 10$$

The formula for calculating the MV of aircraft for the domestic CRAF does not use a common denominator, in fact, only block speed and payload are used as shown below:

$$(6) \text{ BS} \times \text{PL} = \text{MV}$$

BS = block speed  
PL = payload  
MV = mobilization value

In addition, a policy designed to protect the government from having airlines relying solely on government contracts was established. This policy requires participants to have at least 60 percent of their business with the commercial sector of the market. This participation is verified through certification procedures or audit of cost data submitted by the airlines to MAC [7].

The following example provides a detailed look at how domestic CRAF awards have been made under the CAB-established minimum rates. The airlines submit their offers by volunteering set quantities of specific aircraft types. The rates are based on CAB-approved rates and, thus, the evaluation for award is through the process of converting aircraft offered by applying Mobilization Value. For this example, the Mobilization Values were extracted from MAC Request for Proposal (RFP) F11 626-78-R-0033. See Table 1.

Applying this MV against the proposals of three offerors, the contracting officers arrive at the award distribution. If, therefore, there are three responses to this RFP: (1) 12 L-100-30, 9 L-188C; (2)

**Table 1. Calculations for Mobilization Value**

Aircraft	Block Speed (knots)	ACL* (tons)	MV
B-727C/QC	345	17.895	6.174
DC-9-30C	325	17.431	5.665
L-100-30**	245	21.755	5.330
L-100-20**	245	19.005	4.656
L-100-10/L-382**	245	15.920	3.900
L-188C	240	17.310	4.154

\*Carrying capacity as used in DOD planning.

\*\*ACL for the L-100 aircraft are based on CRAF planning factors and pallet height of 100 inches.

**Table 3. DOD Contracts Awards for Commercial Air Movements [2:515;11]**

(Constant Dollars)

Fiscal Year	\$ Million
1963	254.0 (39.9)*
1964	238.3 (40.3)
1965	277.3 (38.6)
1966	438.6 (36.9)
1967	734.3 (42.2)
1968	742.0 (44.6)
1969	669.5 (45.2)
1970	608.5 (42.4)
1971	539.0 (44.8)
1972	531.6 (43.6)
1973	363.7 (41.5)
1974	271.5 (44.1)
1975	352.8 (48.3)
1976	282.9 (51.2)
1977	294.4 (76.7)**
1978	170.0 (62.1)

\* Figures in parenthesis denote the domestic commercial air movement contracts only.

\*\*Includes FY 77.

8 L-188C; and (3) 8 L-188C, and these meet the total requirements, then the percentage of total award would be as illustrated in Table 2.

This award distribution may, however, be further limited by the specific capability of a particular aircraft; i.e., the number of doors. Since some of the established routes do have specific configuration requirements, bidder #2, although by strict application of MV, should have received \$10M (based on a \$50M overall requirement), would only be awarded \$8M because his L-188s only have one door and \$8M is the maximum available for routes with this established requirement. Therefore, although the application of MV does provide a basis for award with the intent of preserving the CRAF, the factors of route requirements, Federal Aviation Administration (FAA) certificates, and other restrictions for the company do have an additional bearing on the final award.

Thus MAC's method of contracting relies on neither competition nor negotiation of final price. Award of contracts is based generally upon proportional contribution to the CRAF.

While the contracting method was relatively straightforward to apply, there were related developments which had a potential impact on the military air freight market. Two of these developments will be highlighted. First, following a rapid buildup for Vietnam in which large numbers of contracts for commercial aircraft were awarded, the use of commercial carriers has decreased. Table 3 portrays the value of contracts with commercial carriers from 1963-1978. The figures in parenthesis reflect only domestic commercial air movement.

The dramatic reduction in overall CRAF contracts can be related to the resolution of the Vietnam situation, with a resulting relatively lower monetary value of these CRAF contracts during recent years [2:516]. This reduction in usage of commercial carrier had the potential of moving many contractors out of the market with a potential loss of aircraft to the CRAF.

**Table 2. Sample Award Computation**

Carrier	No./Type of Aircraft	Mobilization Value	Total Mobilization Points	Percent of Total
1	12 L-100-30	5.330	63.960	60
	9 L-188C	4.154	37.386	
			101.346	
2	8 L-188C	4.154	33.232	20
3	8 L-188C	4.154	33.232	20
			167.810	100



The nature of outsized military equipment has precluded its carriage by some aircraft in the CRAF. At the World Wide Strategic Mobility Conference 1977 sponsored by the Joint Chiefs of Staff, the MAC Commander, General William G. Moore, emphasized:

Our organic resources and the CRAF produce a lot of airlift capability. But continuing studies show that even with all of our civil aircraft in the CRAF, we don't have enough cargo capacity to meet the most demanding wartime contingencies. The shortage is in cargo capability to move the Army's large, heavy equipment, such as M-60 tanks, weighing over 50 tons each, armored personnel carriers, self-propelled guns, and the like . . . of the 225 long-range aircraft, only 130 are cargo capable. Even these cargo versions of the CRAF cannot move the Army's tanks and large guns, . . . . Future Army plans include more of these outside pieces of equipment [8:II-B-6].

Therefore, utilizing contract award procedures which incorporated CAB minimum rates with awards going to bidders in proportion to their contribution might still result in a less than satisfactory CRAF.

On October 24, 1978, almost a year after P.L. 95-163, designed to deregulate the air freight market was implemented, the publicized Airline Deregulation Act, Public Law 95-504, was signed into law. Its major thrust was to amend the Federal Aviation Act of 1968, to encourage, develop, and maintain an air transportation system which relies on competitive market forces to determine the quality, variety, and price of services [9:v]. Additionally, Public Law 95-504 directs the Civil Aeronautics Board to encourage increased entry of both new carriers and existing carriers in new routes and markets to improve the competitive atmosphere. The CAB was also directed to streamline its decision-making process and make provisions for time-phased demise of the CAB by 1 January 1985, unless Congress takes action to the contrary [10:3].

As previously noted, the Armed Forces were exempted from the requirement of competitive pricing when it was in the best interest of National Security. The Deregulation Act did not negate this exemption. However, Congress' direction to the CAB to streamline and prepare for its phased demise led to the review of a number of functions they were currently performing.

On January 1979 in Economic Draft Regulation 370 (EDR-370) the CAB announced their intention to eliminate the minimum rate provisions which are now used as the price structure in Department of Defense air freight contracts for the commercial air carriers. The following justification was utilized:

The board has reviewed its military ratemaking function under part 288 (of the FAA Act of 1958). On the basis of this review, we propose for three principal reasons to amend Part 288 to terminate our exercise of authority over the prices of military charter service, Category A scheduled service, and substitute service, and to rescind three related provisions of our Economic Regulations. First, changes in the economic circumstances of the air charter industry

appear to have eliminated any need to protect charter air carriers from competition through the regulation of military rates. The protection of supplemental carriers was in large part the justification for the adoption of Part 288 in 1961. Second, our experience with Part 288 has led us to question whether the regulation of current military air transportation is an efficient way to supply DOD with both current air transportation and commitments to the CRAF. Third, in a series of statutory changes, Congress has clearly signaled its intention to place the maximum reliance upon competitive market forces for the attainment of satisfactory service and price levels in air transportation [3:2].

Anyone with dissenting views or comments on the proposed changes was given until 12 March 1979 to make them known.

On 19 July 1979 Economic Regulation 1134 (ER-1134), Amendment Number 68 to Part 288, declared that in the future the CAB would no longer set minimum rates. The regulation went on to comment on the correspondence received regarding the intent to cease rate making. About those comments the regulation stated:

In response to the notice of proposed rulemaking, two air carriers (Trans World Airlines and Hawaiian Airlines) filed individual comments, and six carriers (Airlift International, Flying Tiger Line, Hawaiian Airlines, Seaboard World Airlines, Trans International Airlines, and World Airways), filed comments jointly. The Department of Defense filed an answer of TWA . . . none of the commenters oppose adoption of the basic proposal . . . . The six air carriers commenting jointly state that they do not oppose termination of the Board's Part 288 rate setting function. However, they disagree with the Board's statement of historical and economic grounds for the proposed action [5:2].

Additionally, referring to the comments of Hawaiian Airlines:

Hawaiian does not object to the substance of our proposal. However, it states it may "pursue long-term commercial charter commitments for its cargo fleet, and possibly withdraw these aircraft from CRAF, unless some assurance of stability in DOD Contract Pricing is perceived in the near future. . . . Hawaiian also states that the present Logair rate it receives from DOD is too low. . . ." [5:3]

The regulation went on to state the problem of commitment to CRAF

. . . might well be remedied if MAC simply purchased CRAF commitments separately from current transportation, instead of relying on carriers to provide the service as a by-product of their transportation operations. Such an approach, as a minimum, would provide DOD with information about the costs of providing CRAF commitments, and this would allow DOD to develop a purchasing strategy to obtain an optimum level of commitments to CRAF [5:11].

As a result of the Airline Deregulation Act of 1978, the Civil Aeronautics Board has ceased setting the minimum rates utilized by Military Airlift Command to price the variety of Department of Defense airlift contracts they award. Based on this change, a different method of contracting is required which will take into account the goals of increasing market competition and the requirements of the Civil Reserve Air Fleet.

### The Research Approach

During 1979-80, as graduate students in Air Force Institute of Technology's School of Systems and Logistics, the authors undertook a research effort to determine a contracting method which would maintain a flexible and sufficient domestic CRAF, provide efficient peacetime domestic military air freight service and permit competitive market forces to determine price. It should be emphasized that the research focused on the domestic military Air Freight service as related to the Domestic segment of the CRAF. The findings and conclusions reached do not necessarily apply to the Alaskan, Short and Long Range International CRAF segments.

The basic approach was to use a series of interviews and questionnaires to gather information concerning all aspects of the problem from informed sources inside and outside the Air Force, analyze the responses and make appropriate recommendations.

Significant subproblems were identified and developed into four major research questions each with several related supporting questions designed to reveal the information necessary to thoroughly understand major areas of investigation.

Those questions and the specific personnel/organizations responding to them plus the author's analyses of the responses are as follows:

#### **What is the government's definition of competition in light of the Airline Deregulation Act of 1978 as it applies to the domestic military air freight market?**

The criteria used in selecting the respondents to this question was whose definition would most likely be used as the standard for measurement when the question was asked, "Has competition been achieved in the award process for the military domestic air freight contracts?" Based on this, the researchers identified the MAC contracting officer because he will have to make the determination of fair and reasonable price; the Director of Contracts/Acquisition Policy at Headquarters USAF, due to the direction that this office has given to MAC regarding future acquisition of military air freight; and a GAO representative involved in the surveillance of this legislation, mainly due to this body's involvement in reporting to Congress if their intent is being achieved.

Four sub-questions were addressed to the respondents in this area.

#### *What is competition?*

Based on the responses, the researchers found that the principal contracting officer (PCO) at HQ MAC and the staff officer at HQ USAF expanded on the Defense Acquisition Regulation (DAR) definition by explaining basic peculiarities



associated with participation in CRAF and the domestic military air freight market. However, all respondents were in agreement that the basic definition for competition is in accordance with the DAR as summarized below:

- Two or more independent offerors
- Sources are qualified to perform in accordance with the specifications
- Written proposals are submitted based on a solicitation that adequately defines or describes what is required.

*Does the perception of competition differ between the operating levels within the government?*

In analyzing the responses from the different operating levels, it was found that there was no real difference in the perception of competition. However, both HQ USAF and HQ MAC stated that the present method of awarding contracts based on participation in the CRAF could be considered as a form of competition and therefore should be considered as such. Based on the peculiarities of the domestic military air freight market, the airlines' actual contribution to CRAF does force airlines to compete by contributing more to CRAF thus affording themselves a larger percentage of the award. The peculiarities include limited aircraft available to meet the Logair/Quicktrans requirements, the routes that must be flown, and the special certifications that must be obtained for flying domestic military air freight.

*Is competition necessary to secure a more reasonable price?*

Based on analysis of the responses, the researchers found that competition, using the basic DAR definition, is considered to be a vital element in effective pricing. The present contracts (F11626-80-C-0006 and 0007) for Logair/Quicktrans and the procedures leading up to contract award were cited by the respondents as examples of how the government has been able to secure reasonable prices using the CRAF participation as a "form of competition." Though there is only one company presently qualified to provide the L-100 aircraft required by these contracts, it appears in the opinion of the respondents that this form of competition is adequate to secure fair and reasonable prices.

*Do competitive market forces imply more sources bidding for the government business?*

Competitive market forces were found not necessarily to imply more sources competing for award. The respondents did, however, state that restrictive specifications can result in unnecessarily eliminating otherwise acceptable sources which may have the potential to meet the basic requirements identified by the user.

**What are the potential domestic air freight requirements for future contracting to commercial air carriers?**

The judgement sample used for respondents to answer the second research question include: the Chief, Airlift Branch under the Directorate of Distribution, Headquarters AFLC; the Director, Movement Coordinating Department, Navy Material Transportation Office (NAVMTO); the Staff Traffic Management Specialist, Headquarters USAF; the Chief, Programs and Analysis Branch,

Headquarters AFLC; and the Chief, Assistant for Civil Air Division, Directorate of Plans, Headquarters MAC.

The first three individuals mentioned above responded to the following peacetime data requirements questions; the remaining two provided the CRAF activation evaluation data.

*What are the essential Logair/Quicktrans requirements for peacetime air freight services? (Now and forecast through 1985.)*

Among all parties interviewed, the consensus view was that, for the time frame addressed in the interview (through 1985), the requirements projected to exist will not change significantly from that reflected in the FY80 contracts. The researchers attempted to interject certain considerations such as a new handling system on the aircraft or a new weapons system such as the MX. Even when faced with these questions, the respondents continued to predict no major change. Of all things that might possibly contribute to a change, the MX was the only area on which there was some question; however, as one of those interviewed pointed out, requirements would probably only make themselves known somewhere toward the latter part of the five-year time frame.

An interesting side issue to this question came out when the interviewers were attempting to ascertain whether current shipment or requirements were excessive. In reviewing priorities of what was being moved, several of the interviewees volunteered the view even though they could not be decreased without substantial degradation to the military transportation system, and Logair/Quicktrans in particular. A view expressed was that if contractors were to perceive a future of diminishing revenues, they might actively seek out other business and leave the marketplace.

An assessment of all information involved led the researchers to state for purposes of this study that future requirements in the respondents' view will not be dramatically changed from those being met today; and there appears to be little chance of any substantial reduction on the part of the Air Force in requirements.

*Do these requirements (the requirements of the users) identified as essential differ from the requirements used to solicit contractual sources?*

In analyzing this question, the researchers utilized not only the responses of the sample but additionally compared the responses to the Request for Proposal and the actual contract. In addition to the responses of the MAC contracting officer and NAVMTO Movement Coordinating Department Director, questions were asked of the AFLC Airlift Requirements Chief, to ascertain the extent of the requirements validation. Those responses were of particular interest for two reasons. First, it is between their agencies that any requirements translation problems would most likely occur. Additionally, it is at these levels where challenges to individual base requirements will be most effective.

In the course of the interviews and examination of several source documents, it was found that, with only minor exceptions, the requirements generated at base level were valid and not excessive to meet mission needs. These requirements were accurately duplicated in the actual Requests for Proposals and the contract as awarded.

*How do these requirements (the requirements generated at base level) compare to the real needs of the using activity?*

In assessing this question, the researchers were concerned with whether AFLC, NAVMTO, and MAC challenged the users' forecasted rates and any special requirements, such as size or number of loading doors, which may have been generated.

It was determined that AFLC frequently challenges the requirement demands of the users. Specifically at AFLC headquarters a number of reports are kept which periodically update usage. These reports provide both AFLC and MAC with specific information as to which bases and commands can more accurately forecast their requirements. Those who do not forecast well will receive more attention and more challenges to their requests than those who traditionally forecast with a high degree of accuracy. One document shown to the researchers by the AFLC Distribution Branch was a matrix called a cargo shipment table. The table portrays tonnages forecasted and actually moved from point to point. It clearly demonstrated why challenging was a necessary feature. Accuracy of predicted-to-actual relationships showed extreme variances with a number of bases over- or under-estimating their requirements by 50 percent or more. There are many reasons for this condition, and they are not necessarily the fault of the bases involved. It appeared that AFLC and MAC were well aware of this variance and challenged requirements when they felt predictions were subject to question.

It is noteworthy to point out that the MAC contract as currently written provides adequate flexibility to adjust to changing or modified requirements and to insure that these changes in demand can be handled through the existing contractual arrangement for both Logair and Quicktrans.

In addition to tonnage requirements, various handling specifications which relate to the type of aircraft being utilized such as number of loading doors and truck bed height access, were reviewed and found to be consistent with what was being moved by Logair. The Navy Quicktrans requirement for truck bed height loading was questioned but was found to be appropriate due to the size of certain items that need to be handled and the handling equipment presently available.

*What is the basis for establishing the time requirements for delivery associated with the different routes?*

All respondents indicated that the time requirements for movement by Logair/Quicktrans are established under Military Standard Transportation and Movement Procedures (MILSTAMP) specified in DOD Regulation 4500.32R and more specifically the Uniform Material Movement and Issue Priority System (UMMIPS) as specified in DOD Directive 4410.6. No items may be moved on Logair/Quicktrans unless it is under MILSTAMP documentation, and MILSTAMP documentation requires a UMMIPS priority. It is these UMMIPS priorities which have specified delivery time frames which decide whether an item is a Logair/Quicktrans candidate [12].

The AFLC respondent provided data to the researchers which indicated that items moved by Logair did in fact contain the proper priority designations. The usage by priority informations

provided was, to the researchers' knowledge, consistent with the types and priority of items which are tasked to be moved on Logair. Specifically it was found that approximately 14 percent of the cargo to be flown by Logair originating at an ALC and delivered to its destination was rated at a 999 priority while approximately 42 percent was Transportation Priority (TP) 1, 40 percent TP 2 and 4 percent TP 3. A review of written documentation was not conducted on Quicktrans; however, in discussion with the selected respondent for Quicktrans, the researchers found that the results were similar in meeting the UMMIPS priority.

#### *How are the specific routes established?*

Through the response gained from the interview with the chief of the Airlift Branch, HQ AFLC, the researchers found that the establishment of the routes was based on such objectives and requirements as: (1) no more than one transfer of cargo, (2) service mission bases once daily from one ALC, (3) minimize service to bases less than 100 miles contiguous distance, (4) serve mission bases with minimum of 150 tons cargo requirements, (5) the payload requirements to be shipped to and from the mission bases, (6) the ground equipment available at the bases, (7) the goal of maintaining combat readiness of first line weapon systems, and (8) the availability of the type of aircraft that can meet the 463L ground equipment capability and payload requirements.

The combination of these objectives and requirements serves as the basis for the present route structure.

#### *Based on present routes and forecasted changes, what are the bases for the domestic CRAF?*

The appropriate respondents in the AFLC and HQ MAC indicated that the actual validation of the domestic CRAF and testing of its ability to meet emergency requirements has been done through regression analysis of AFLC workload. This statistical method is used in determining a factor that is applied to the current number of regularly operating aircraft to establish the number of aircraft required for the domestic CRAF. This factor and much of the methodology in obtaining it are classified and to the best of the AFLC respondent's knowledge, the factor has not been provided to MAC to assist them in the contracting processing. It appears to the researchers that the factor is multiplied against the aircraft currently doing the workload and if the result is exceeded by number of aircraft in the domestic CRAF, it is assumed that this segment is adequate. Analysis of this area indicates that the validation process is actually after-the-fact and does not guide the contracting process.

#### *Are the aircraft assigned to the domestic military air freight service also adequate for the domestic CRAF?*

The consensus of all respondents was that the current aircraft in the domestic CRAF will more than adequately meet any foreseeable emergency requirements. [As an example where other aircraft have been used, they cited Project Nickel Grass (a 1973 DOD project in conjunction with the Yom Kippur War) in which other aircraft were utilized in lieu of the domestic aircraft assigned, circumventing the standard Logair routes. These aircraft, however, were only used on those routes

which linked Aerial Ports of Entry (APOE) and were added for economic efficiency due to increased tonnage rather than for effectiveness. It was suggested by one of the respondents that the domestic CRAF could have done the job as effectively.]

#### **Who are the eligible suppliers in the domestic military air freight market and what are their motivations for participating or not participating in the market?**

The marketplace, through the proposals returned from the airlines in response to the RFP in recent years, establishes the types of aircraft which can meet the required specifications set forth in the RFP and that will allow performance of the of the contract at the lowest reasonable cost to the DOD. Two aircraft, the L100-30 and L188C, have been consistently proposed for the past several years. Only the DC-9-30 was found competitive with the L188, and no aircraft could meet those established requirements met by the L100-30.

The researchers in this analysis have not inferred other aircraft were not capable of servicing the Logair/Quicktrans contract, but are only reporting that from the information gathered, the aircraft presently used were the most economical based on existing requirements. This is an important distinction because if certain variables such as tonnage hauled or the route structure were to be changed, so in all likelihood might the type of aircraft. This could result in other aircraft such as the B-747 and B-727 cargo aircraft becoming more economical and viable for the established military domestic air freight market.

The airlines capable of providing the types of aircraft (the L100-30 and the L188C) required for both peacetime domestic service and emergency CRAF were identified and surveyed. In addition, in order to gain information about the attitudes of other segments of the airline industry toward Logair/Quicktrans and the CRAF, a selected sample of other airlines, who either possessed a number of cargo aircraft, were formerly under contract or had the potential for entering the market in the future, were also surveyed. The specific airlines surveyed and the rationale for their selection are shown in Table 4.

#### *Is the airline familiar with the domestic military air freight market?*

With the exception of one airline, all respondents indicated that they were familiar with the domestic military air freight market either as current participants or as recipients of annual Requests for Proposal. The one exception indicated some familiarity with the subject area. Further analysis of this response reflected that this airline was newly established and had not been in either the passenger or air freight market until recently.

#### *Are airlines willing for a price (and what is that price) to place their aircraft in the CRAF while not securing a domestic military air freight contract?*

This particular question elicited dramatically different reactions depending on the respondent. Two firms currently participating in the domestic air freight market and domestic CRAF emphatically stated that they would not participate in a program where providing aircraft to the CRAF did not secure them a peacetime air freight contract. They also stated that such a contract would not be in the best economic interest of the government.

The one participant who did not take this position indicated that monetary incentives would be necessary to induce their participation and, in addition, they would require "war-risk indemnification." The airline provided an estimated price for this CRAF participation of between fifty and one hundred thousand dollars per L188 aircraft per year. In addition, one hundred fifty thousand dollars would be required for each flight crew required solely to meet surge requirements with less than sixty days lead time. For this consideration, the firm would be willing to offer its entire cargo fleet to the CRAF.

Those currently outside the program provided mixed responses with only one airline providing a figure estimating the cost of such participation. The cost figure was furnished by the same firm which was only somewhat familiar with the domestic military air freight market. While there were those who would appear to be willing to provide aircraft to the CRAF separately, perhaps this quote from one of the respondents best summarizes the majority opinion expressed by both participants and non-participants.

**Table 4. Surveyed Airlines**

<i>Name</i>	<i>Reason for Selection at Time of Survey (FY80)</i>
Transamerica Airlines, Inc.	Under contract
Hawaiian Airlines, Inc.	Under contract
Zantop International Airlines, Inc.	Under contract
Trans World Airlines, Inc.	Experience with international airlift service and respected within the industry.
Eastern Airlines, Inc.	Experience with international airlift service and respected within the industry.
Alaska Airlines, Inc.	Experienced airline. Possesses aircraft currently used in domestic military air freight market.
Evergreen International Airlines	Participating in international contracts and past participant in the domestic military air freight market. Has viable aircraft assigned to CRAF.
Midwest Airlines	New potential airline for participation in the domestic military air freight market.

I believe that (firm's name) interest in CRAF participation must be tied to a single negotiated contract providing primary air freight service. Competitive bidding for such services with a separate procurement for CRAF would seem to be a more expensive proposition for the government in the long run.

*Is there a dollar value attached to participation in CRAF?*

Current participants agreed that there were costs associated with being a member of the CRAF. One member called them minimal, and another called them potential, but not currently affecting the airline. The third current participant, however, felt there were definite costs involved and stated: "Speaking strictly to the aircraft involved in domestic CRAF, the figure would be in the range of \$30,000." (This would be per aircraft per year.)

All current participants seemed to agree that the principal participation costs fit in two categories: equipment and systems modification, and storage of systems.

Nonparticipants' responses were once again divided, with those who were knowledgeable of the market indicating that CRAF participation did involve costs to the airlines. Their estimates were substantially lower than those of the participants. Those firms with less knowledge of the market were inclined to state that there were no additional costs associated with being a member of the CRAF.

*Are the airlines willing to bid on domestic air freight contracts?*

The responses from current participants in this area were split with two airlines indicating satisfaction with current contracting methods and one expressing discontent with both the contracting method and pricing of domestic air freight contracts. Those satisfied felt it was a time-proven method which has, to quote one respondent, "survived both domestic and international contract negotiations with many carriers on the one hand and presumably a satisfied government customer on the other."

Even with the favorable response from the majority, there were several areas in which they felt improvements on present methods could be made. Criticisms were leveled at the areas of current contracting and pricing methods. Though there was no general consensus on the issues, two areas did provide a consistent thread of concern.

The first area was the redundancy of paperwork the contractors have experienced. Specific examples cited were in the fuels area with the Quicktrans contract being the best documented example. One contractor called the multiple documentation redundancy (his own words) "clerically staggering." Though they consider this paperwork a problem, the contractors made every effort to point out that they were not upset over current fuel pricing procedures.

A much more clearly identified concern was that of protection from these inflationary times and a requirement for a more timely mechanism for recovery of inflationary costs. This same concern was expressed by nonparticipants; however, none of the respondents provided specific examples and there was little indication of dissatisfaction. As previously mentioned, the fuels pricing procedure

when the government does not provide the fuel reimburses the contractor for the fuel cost incurred above the DOD-established rate.

Other general areas mentioned by the airlines were individual in nature. Several are listed below without comment or analysis to provide insight into airline concerns:

1. Return on investment must be compensatory to and time correlated with current costs of money.

2. Interest expense should be included as allowable costs of performing airlift.

3. The provision for allowability of taxes must include taxes in addition to federal if such taxes are incurred in performance of airlift.

One current participant was not satisfied with either the current method of contracting or the pricing of air freight contracts. Two extracts of the airline's responses are presented below which capture the essence of the complaint.

(1) Requirement for large number of 2 door, 34,000-pound aircraft is anachronistic and counter-productive to CRAF modernization, limiting eligibility to a small number of 21-year old L-188 aircraft with rapidly escalating maintenance costs. More generalized specifications of aircraft types would stimulate greater competition for government business.

(2) "Pricing system is unresponsive to carrier cost differences on low aircraft utilization versus high aircraft utilization routes."

The respondent goes on to make suggestions to resolve some of this conflict. One suggestion is pricing by route or regional route "package"; however, it is clearly pointed out that the airline still desires the fuel cost escalation protection.

Nonparticipants expressed general satisfaction with the current method of contracting or contract bidding. The reasons given for their nonparticipation are covered in the next question.

*Why are some airlines unwilling to bid on domestic military air freight contracts?*

The "bottom line" on this question is that it is not economically feasible for them to do so. General responses were of the nature:

1. No excess aircraft available.
2. No participation due to types of aircraft required are fully utilized today in commercial market.
3. Carrier does not operate all-cargo aircraft.

The analysis of the responses demonstrated to the researchers that, were it profitable to operate in this market with present equipment, the airlines would not be adverse to bidding on Logair/Quicktrans contracts. However, the profit would have to be competitive with that attainable in the private sector to obtain those assets which are already fully utilized. There was no indication that any airline would purchase additional assets strictly to serve the domestic military air freight market. Certain airlines did admit to expansion plans over the next five years and indicated that they might be interested in future Logair/Quicktrans contracts.

*What will be needed to motivate industry to participate in the emergency and peacetime domestic military air freight market?*

Industry does not generally express a desire to contract separately for provision of the CRAF, though some firms are willing to do so for a price. Those capable at this time of providing CRAF assets generally see no economic advantage to doing so on a separate contract basis. Industry, in a majority of cases, believes that the tie between military contract award and filling CRAF requirements is essential.

For peacetime service the government must compete with all other customers for the resources available in the marketplace. Should new more profitable markets for aircraft currently used become available, the government, to secure required aircraft resources, must be prepared to either pay more or look for other aircraft types. One of the respondents indicated that a more generalized specification of aircraft type would stimulate greater competition for the peacetime domestic air freight market. At the same time, should the commercial market suddenly develop aircraft excess to its need and responsive to the specifications, indications were that the airlines would not be adverse to bidding on government contracts. The economics of the marketplace seem to be the driving force behind motivating participation in the domestic military air freight market.

**What contracting method will incorporate the findings of subproblems one, two and three and meet the objectives of securing adequate competition while not degrading the present contribution to the CRAF?**

The population of contracting personnel capable of providing valuable input to this study is quite large. Due to the large volume of information which could be provided from this population and our limited capability to analyze it due to constraints such as time, a judgmental sample of contracting officers identified by the researchers was utilized. To avoid bias, this sample does not include the PCO or the ACO on the current contract but does include qualified contracting officers having at least ten years of contracting experience as well as general knowledge of this problem. By sampling such contracting personnel, the researchers provided an opportunity for the responses to be reflective of opinions that could be relatively objective and lacking personal bias based upon direct experience with contracting for military air freight service.

*With the information from the responses of subproblems 1, 2, and 3, how should competitive contracting for domestic military air freight service be accomplished?*

The responses from the contracting officers were mixed between formal advertising and negotiation; however, the majority preferred formal advertising. The arguments in favor of formal advertising were based on the opinion that the requirements of the government could be clearly, completely, and accurately stated and that these were not anticipated to change over the next five years. The respondents argued that the marketplace should be able to provide competitive prices without the present built-in protection afforded the contractors when the government sets rates. Additionally, in spite of the specification the majority of the requirements could be met by at least two responsible bidders. It was also felt that by use of formal advertising any

bias or perceived bias that only current participants are eligible for award would be eliminated.

A fixed price contract with an escalation clause tied to fuels costs was believed to be the most appropriate type of contract by a majority of the respondents. One respondent did recommend a cost type contract, were peacetime and CRAF requirements to be separated, for the emergency requirements but agreed that the domestic peacetime requirement for military air freight service should be contracted with a fixed price type contract. The fixed price type of contract could be used whether advertised or negotiated; however, those preferring negotiation expressed a need to discuss the requirements with the very limited number of sources prior to award of any contract.

None of the respondents favored multi-year contracts due to the risk and increased contingencies that contractors would need to include in their proposals. It was pointed out, however, that contractors in other aerospace-related industries are accepting firm fixed price contracts for a three-year duration with no economic price adjustment clause. Additionally, although not recommending for use, one respondent suggested that multi-year contracts had the potential to entice investment by other firms currently outside the existing market and thus eliminate the present minimum competitive base. Multi-year contracting would mean the government might incur a very substantial cancellation cost if services were terminated, but this situation does not at present appear to be a likely circumstance.

*Is there a need to split the acquisition of CRAF from the contracting for domestic military air freight service?*

Only one respondent felt that the splitting of requirements would be advantageous. This respondent felt that the CRAF needs could be secured through the use of a Cost Plus Incentive Fee (CPIF) type contract and that the combination of a fixed price type for the peacetime service and a cost type for the emergency service would be less expensive and just as reliable as the present method now used to secure both Logair/Quicktrans and domestic CRAF. His opinion was that the costs involved under a cost type contract for the CRAF would be minimal and fall drastically after the first year as the basic requirements would not change and thus cost would only relate to additional administrative effort. Continuing, he pointed out that the first year would not be expected to create high costs based on his belief that most airlines that would participate would make investments or have made investments prior to any initiation of IFB or contract award. In most of the responses, it was clear that there was no basis to even consider the use of cost type contracts. Whether evaluating peacetime or emergency, there was no high risk factor and plenty of history was available to both parties.

Those respondents who felt there was a need to secure both requirements under the same contract expressed some interesting thoughts relative to using the marketplace to provide competition while at the same time providing incentives for CRAF participation. Their suggestions provided input to the next investigative question.

*How could contracting for both emergency and peacetime domestic military air freight service be*

*achieved with competition as the method for determining price?*

The proposals for including both emergency and peacetime effort under one contract ranged from a system of allocation with preference given to the low bidder, to a method providing a bonus structure for participation in the CRAF with award based strictly on lowest price. An imaginative solution was proposed by one of the respondents on the problem of maintaining the CRAF while still contracting for the domestic service through the formal advertising procedure. This respondent suggested a formula that would be included as a separate line item in the Invitation for Bid (IFB). This line item would invite the bidders to bid on the needed CRAF as an incentive in the form of an insurance policy. The unit price for this line item, which would be a factor in the determination of overall low bid, would be divided by 360 to determine daily price for each aircraft committed to the CRAF. As the committed aircraft were used for other purposes the price for this item would be reduced by the daily rate (13). In other words, for each day that the committed aircraft were in use the government would pay nothing, but for those days that the aircraft was idle the government would pay the daily rate in return for the availability of that aircraft should it be required for CRAF. The competitive marketplace would again be used to provide reasonableness for the rates established; however, they would cover only those allowable costs as determined by MAC.

The potential advantages of this proposed method included: (1) allowing competition to set the prices, (2) providing adequate protection to the bidders so that they would commit resources to CRAF, (3) identifying the cost of CRAF, (4) avoiding unnecessary expenditure for the CRAF commitment, and (5) avoiding the present rate setting method which does not provide true competition.

*What incentive structure could be used to secure greater participation by those qualified sources?*

All respondents, whether favoring the acquiring of service through the procedures of formal advertising or negotiation, agreed that there is a need for a special economic escalation clause for fuel. Other types of incentives besides those provided in response to the previous question were determined to be nonessential or of minimal benefit in securing these services. For example, to put an incentive on schedule would reward a contractor to get to the next delivery point faster. Because of government requirements, early delivery may create delays or even loss of service if the government did not have shipments ready for the contractor to transport. This may also conflict with other areas such as energy policy. Increased speed will in all likelihood increase fuel consumption, all other factors being equal.

In discussing incentives on cost, the respondents stressed that the most likely means to reduce cost were by lowering profit or cutting corners on maintenance or crew ratio, neither of which would benefit the company or the government. Although one response did recommend an incentive tied to performance, the majority of the respondents did not feel it was required because the performance parameters specified were being met without additional motivation. By including performance incentives, the government might expose itself to arguments relative to which party caused a delay and be

inviting claims under the disputes clause.

## Recommendations

It would follow from the above that the authors would recommend that the procedures using formal advertising be followed in awarding a fixed price contract with an escalation clause for fuel when seeking a domestic military air freight contract. After further evaluation of all the data gathered, however, the authors concluded that this approach was not feasible. The following reasoning supports this view:

1. Requirements cannot be clearly, completely, and accurately stated. It is true that the basic specifications which are used in determining the types of aircraft are firm and the routes requiring service are well established, but because of uncertainty of daily requirements, the contracts must include clauses for expansion of both peacetime and airlift emergencies as well as CRAF activation. In reality, the makeup of the routes is not completely known in advance. The timetable of flight operations is made up daily, and therefore is not available in advance. Additionally, under current procedures, the CRAF requirements cannot be accurately specified in advance, even for Stage II.

2. The marketplace is not sufficiently responsive to rely on it alone to provide fair and reasonable prices. Unless the specifications are changed and there is an increase in the number of responses to the solicitations, the marketplace does not provide sufficient bidders to allow true competition to determine final price. At present, there is only one responsible source for the L-100-30 aircraft and only two additional firms bidding on the routes designated for the L-188C aircraft (considering split of one- and two-door). The researchers feel that the firms possessing the required aircraft would be substantially immune to the stimulus of competition in proposing price under formal advertising.

3. Formal advertising is not an effective tool to eliminate the perceptions that some airlines may have regarding the difficulty of entering the market, since it allows no discussion relative to the requirements. Profit levels and restrictive specifications were found to be reasons why other airlines are not entering the domestic military air freight market. No evidence was gathered from the research to indicate that potential or past participants felt that the contracting method prejudiced their opportunity for award. The requirements as to exact type of aircraft is of concern, but the negotiation procedure used under 10 USC 2304(a)(16) is not.

4. Formal advertising may produce lower prices for preferred routes, but the offsetting increases for the undesirable routes will probably not produce any net savings for the aggregate route network. The main concern in this regard is not so much the higher price bid on the less desirable routes, but the possibility of obtaining no bid on certain routes. This is not to say that such provisions, as suggested by the respondents during the interviews, of tying award to the allocation of such routes would not be effective, but it is felt that such a procedure would be less effective and would force the bidders to add additional contingencies to their bids. Thus, this countering tactic would raise the otherwise lower price that could be expected if no such restriction were placed on the award.

Based on the reasons set forth above as well as

Continued on page 29



# CURRENT RESEARCH

## Air Force Logistics Management Center - FY81 Program

The Air Force Logistics Management Center (AFLMC), located at Gunter AFS, Alabama, is a Headquarters USAF functionally controlled unit. The mission of the AFLMC is to improve Air Force logistics. More specifically, the Center studies, develops, tests, evaluates, and helps implement policies, procedures, and systems which will improve logistics readiness, sustainability and capability. While the AFLMC's main thrust is to solve today's problems, it is also committed to shaping tomorrow's logistics activities. The Center receives policy direction and guidance from the HQ USAF Director of Logistics Plans and Programs and a Board of Advisors composed of senior AF logisticians. The Board provides broad program guidance and exercises overall control to ensure that the Center's programs are responsive to the current and long-range logistics needs of the Air Force.

The capabilities of the AFLMC are primarily directed towards solving real world logistics problems. The projects employed in working these programs range from specific short term taskings to long-range multi-discipline efforts. In carrying out the Center's mission, four principles are employed. First, the AFLMC strives to isolate the cause of problems and develop solutions quickly. Second, priority consideration is given to those enhancements which do the most to improve logistics capability in wartime sortie production areas. Third, problems are attacked from a total logistics perspective rather than from a single discipline such as maintenance or supply. Finally, Air Force implementation is the objective of all Center efforts.

Below are several projects currently in progress at the AFLMC. If you have an interest in any of these projects, contact the project officer listed. The commercial telephone number is (Area Code 205) 279- plus the last four digits of the Autovon number.

### Current Projects

#### *Future Logistics Infrastructure and Impacts II*

Objectives: Describe a logistics infrastructure that will provide responsive, flexible wartime support based upon the projected future environment; identify future impacts on the logistics system through the year 2000 and identify strategies to overcome the projected impacts.

Focal Point: Major Johnson, AFLMC/LGX, Autovon 921-3535

#### *AFR 400-25, Logistics Plans Management*

Objective: Publish an Air Force regulation that outlines the overall functions and responsibilities of Logistics Plans and logistics planners within the various organizational levels and structures in the Air Force.

Focal Point: Major Leigh, AFLMC/LGX, Autovon 921-3535

#### *COMPES Automated Load Planning Systems (CALPS)*

Objectives: (1) Develop an on-line computerized simulation model capable of load planning Air Force mobility equipment/personnel on military cargo aircraft and Civil Reserve Air Fleet (CRAF) aircraft. (2) Develop an automated program for use at base level to plan palletization of cargo using 463L system cargo airlift pallets. The model documentation on the two models will provide a baseline for production of a formal change to the Contingency Operation/Mobility Planning and Execution System (COMPES) Functional Description for development of a standard base level automated load planning system as a subsystem of COMPES.

Focal Point: Lt Col Osborne, AFLMC/LGX, Autovon 921-3535

#### *War Reserve Materiel Compendium*

Objective: Address the total spectrum of the War Reserve Materiel (WRM) program in three volumes: (I) An Executive Summary of management considerations impacting WRM, including the interrelationships of the DOD components/agencies involved; (II) A middle manager user's guide; (III) A cross-reference of regulations, manuals, and directives affecting WRM.

Focal Point: Capt Cameron, AFLMC/LGX, Autovon 921-3535

#### *Ground Fuel WRM Computations*

Objective: Develop improved methods for determining WRM and contingency requirements for bulk fuel for vehicles and equipment fuel consumption rates and anticipated usage rates.

Focal Point: Major Froelich, AFLCM/LGX, Autovon 921-3535

#### *COMPES Feasibility Analysis Enhancements*

Objectives: Identify logistics feasibility analysis requirements in support of contingency planning and operation execution. No Air Force standard system exists for feasibility analysis of non-unit related assets such as munitions, rations, TRAP, housekeeping material, POL, etc.

Focal Point: Major Leigh, AFLMC/LGX, Autovon 921-3535

#### *Base Repair Factors for Wartime Spares*

Objectives: To determine if, in advent of war, base repair will be able to sustain current Not Repairable This Station (NRTS) rates and if factors can be developed, by NSN, showing what base repair supervisors believe are realistic NRTS rates. The purpose of this study is to determine the feasibility of base repair facilities developing factors, by NSN, reflecting their anticipated repair capability for individual repairable spares in a wartime environment. These factors could be used to refine the wartime requirements computation for spares and the anticipated depot level workload.

Focal Point: Major Hughes, AFLMC/LGM, Autovon 921-4583

#### *Simulation Model of Conventional Munitions Buildup for Analyzing Resource Requirements*

Objective: Develop a simulation model of conventional munitions support processes from removal of the munitions components from a storage building through delivery of assembled munitions to load crews. Present means of determining the effects of changes in munitions support resources (manpower, munitions, trailers, vehicles, test equipment, etc.) on sortie generation are inadequate for planning and forecasting purposes.

Focal Point: Capt Greenly, AFLMC/LGM, Autovon 921-4581

#### *Desk-Top Computers at Base Level*

Objective: Provide base level managers minicomputers to aid them in decision making and give them flexibility not attainable in standard systems. Minicomputers will aid local managers in tracking nonrecurring operations such as transfer and acceptance inspections.

Focal Point: Capt Thompson, AFLMC/LGM, Autovon 921-4581

#### *Wartime Automation Requirements for Maintenance*

Objective: Determine what automated maintenance management processes are critical to the ability of maintenance organizations to provide ready maintenance forces for contingency and combat operations. Determine the characteristics of the system needed to satisfy these requirements. Includes on-going prototype effort for a deployable engine tracking capability for F-15, F-16, and A-10 aircraft.

Focal Point: Lt Col Dietsch, AFLMC/LGM, Autovon 921-4583

#### *Centralized Technical Order (TO) Management*

Objectives: Improve the management and responsiveness of the USAF Technical Order System, determine the effectiveness of existing and improved technical manuals, systems, policies, procedures, and techniques, and maintain liaison with other services technical data activities to avoid duplication in Research and Development efforts for improving technical data.

Focal Point: Capt Noyes, AFLMC/LGM, Autovon 921-4581

#### *Maintenance Scheduling Research*

Objective: Investigate the application of computer modeling to the scheduling process. If found inapplicable, determine whether or not specific scheduling rules to help schedulers cope with day-to-day problems can be developed.

Focal Point: Lt Col Dietsch, AFLMC/LGM, Autovon 921-4583

#### *Lifetime Warranted Tool Program*

Objective: Investigate the Quality Deficiency Reporting system with respect to hand tools, examine the Federal hand tool specification process, identify problems in hand tool procurement and conduct a life cycle cost comparison between General Services Administration (GSA) and commercial hand tools. Procure lifetime warranted tools for use by AF maintenance activities to increase productivity and reduce O&M costs.

Focal Point: Capt Hauck, AFLMC/LGM, Autovon 921-4581

#### *Automated Avionics Test Station Status Reporting System*

Objective: Recommend a method to monitor all avionics test stations on a real time basis without increasing the manhour expenditure required for data input. The manual and semi-automated systems being used in the field do not provide common indicators of avionics test station status that can be shared with all test station users. There is no status reporting system in existence that reflects the true capability of test stations to support mission requirements.

Focal Point: CMSgt House, AFLMC/LGM, Autovon 921-4581

#### *Maintenance Training Improvement Program (MTIP)*

Objectives: Determine the application of new training methodologies and equipment to Air Force training and work specific taskings as requested by various Air Force organizations.

Focal Point: Major Townsend, AFLMC/LGM, Autovon 921-4583

#### *Time Compliance Technical Order (TCTO) Reporting Procedures*

Objective: Determine where TCTO data is being lost in the present TCTO management reporting system, through comparison of MMICS vs the Maintenance Data Collection (MDC) System, MDC System vs the Product Performance System (D056), D056 vs data received by the ALC systems and data received by the ALCs vs that processed into the respective configuration management systems. The AF Data Systems Design Center is performing the comparisons and some analyses of the comparison findings.

Focal Point: Capt Noyes, AFLMC/LGM, Autovon 921-4581

#### *Reliability Centered Maintenance (RCM)*

Objective: Document the USAF program which implements the Airline MSG-2 technique for determining scheduled maintenance tasks. Attempt to assess the benefits of RCM. Identify problems and recommend solutions for RCM implementation.

Focal Point: Lt Col Allison, AFLMC/LGM, Autovon 921-4583

#### *Automated Data Processing in Base Contracting for the 1980s*

Objective: Identify and resolve ADP shortfalls in the Customer Integrated Automated Purchasing System (CIAPS); and determine contracting ADP modernization needs over the next ten years.

Focal Point: Capt Lail, AFLMC/LGC, Autovon 921-4085

#### *Productivity Enhancement Through Increased Technological Awareness*

Objectives: (1) Determine the extent to which working level personnel are aware of new technology. (2) Determine the principal means through which this awareness is achieved. (3) Identify impediments, if any, in this awareness process. (4) Determine what should or can be done to enhance working level technological awareness.

Focal Point: Capt Lail, AFLMC/LGC, Autovon 921-4085

#### *Organizing for Contract Administration*

Objectives: Review the current criteria by which bases decide whether or not to form a separate contract administration branch, develop possible alternative organization structures, and develop objective criteria by which the base contract managers can select the most appropriate structure to fit their individual needs.

Focal Point: Capt Lail, AFLMC/LGC, Autovon 921-4085

#### *Pricing and Negotiation at Base Level*

Objectives: (1) Examine capabilities to perform pricing and negotiation action on base level contracts. (2) Determine adequacy of current pricing and negotiation guidance for base level buyers. (3) Assess status of buyer's training in pricing and negotiation techniques. (4) Prepare report of findings and conclusions which will recommend any needed changes in guidance,

procedures, or training. (5) Develop Base Level Pricing Guide.

Focal Point: MSgt Bloomquist, AFLMC/LGC, Autovon 921-4085

#### *Local Purchase Support for Overseas Activities*

Objective: Improve CONUS local purchase support for overseas activities. This will affect supply readiness by reducing depth of stock requirements.

Focal Point: Mrs. Powell, AFLMC/LGS, Autovon 921-4165

#### *DYNA-METRIC*

Objective: Determine the capability of the DYNA-METRIC model to relate WRSK support levels to combat capability and integrate this model into the Combat Supplies Management System (CSMS).

Focal Point: Capt Ogan, AFLMC/LGS, Autovon 921-4165

#### *Demand Forecasting*

Objective: Recommend a forecasting technique for providing the best estimate of future usage, in the Standard Base Supply System (SBSS). Current SBSS demand forecasting is an unorthodox prediction scheme which may lead to suboptimal forecasting.

Focal Point: Major Lombardi, AFLMC/LGS, Autovon 921-4165

#### *Order and Ship Time (O&ST) Study*

Objective: Identify a method of computing O&STs more accurate than the method currently used in the Standard Base Supply System. This methodology will then be used to model the O&ST distribution for priority group three requisitions.

Focal Point: Capt Folk, AFLMC/LGS, Autovon 921-4165

#### *Material Storage and Distribution at Austere Forward Locations*

Objective: Evaluate the movement of large amounts of property into austere locations during contingencies, study the problems associated with getting the property identified, located, and protected in a timely manner, and make recommendations for improvements to procedures and processes.

Focal Point: Lt Col Magner, AFLMC/LGS, Autovon 921-4165

#### *Source Data Automation (SDA)/Standard Base Supply System (SBSS) Base Service Data Enhancement*

Objective: Test SDA technology through the use of commercially available Point of Sale (POS) equipment in the supply complex; specifically in the Base Service Store retail outlets. Provide pilot effort upon which applications of POS equipment within the SBSS can be examined. Evaluate alternative machine readable symbologies for future use within Air Force retail outlets.

Focal Point: SMSgt Gwaltney, AFLMC/LGS, Autovon 921-4165

#### *Modifications of the Standard Base Supply System Stock Leveling Techniques*

Objective: Insure that the new retail stockage policies and procedures spelled out in DOD Directive 4140.44 and DOD Instruction 4140.45 are implemented in the Air Force Standard Base Supply System. Additionally, various improvements/modifications will be evaluated for possible inclusion in our standard system.

Focal Point: Capt Faulhaber, AFLMC/LGS, Autovon 921-4165

#### *Validate/Identify Pipeline Losses from Source of Supply to Base Supply*

Objective: Validate and identify losses related to shipments to Base Supply and develop corrective procedures/policies. Data is being collected to determine if losses relate chiefly to consolidated shipments or if they occur randomly in consolidations and single shipments.

Focal Point: Mrs. Powell, AFLMC/LGS, Autovon 921-4165

#### *Major Repair Decision Process for Special Purpose Vehicles*

Objective: Identify the best possible major repair decision policy. However, since this would be a long term solution, a separate effort will attempt to improve the current program within the present fiscal constraints.

Focal Point: Capt Friedl, AFLMC/LGT, Autovon 921-4464

#### *Traffic Management Indicators*

Objectives: Develop indicators to be used for performance analyses and to assist management decision making, develop performance standards based on historical data, identify areas and emphasis for better transportation training, and examine processes and interrelationships that may aid later reorganization and/or automation of the traffic function.

Focal Point: Mr. Sampson, AFLMC/LGT, Autovon 921-4464

#### *Logistics Applications of Automated Marking and Reading Symbols (LOGMARS)*

Objective: Provide technical assistance to the DOD logistics community on matters concerning source data automation applications and policy, and to all Air Force activities implementing LOGMARS applications. Examine alternative means of automated marking and reading symbols. Determine common data elements (NSN, TCN, Unit of Issue, etc.) to be encoded on all items of supply, unit packs, and outer containers. Evaluate costs and benefits for DOD wide implementation of the announced DOD 3 of 9 bar code/OCR-A standard.

Focal Point: Lt Col Morgan, AFLMC/LGY, Autovon 921-4524



### Logistics Capability Assessment Techniques (LCAT)

Objective: (1) Develop techniques and methods to quantify and measure the impact of logistics variables on operational capability and force readiness, and, (2) Determine definitions applicable to logistics capability assessment; analyze and evaluate prior academic, Air Force, and DOD sponsored studies of capability assessment; and prepare a classification system for capability assessment methodologies.

Focal Point: Major Denham, AFLMC/LGY, Autovon 921-4524

### Technology Transfer and Innovation

Objective: Explore, test, and increase awareness among logisticians of new technologies which present opportunities for eliminating deficiencies or reducing operational and support costs. Current efforts are centered on conducting a literature review and performing case study analyses to formulate a structure/theory for technology transfer in logistics.

Focal Point: Captain Allen, AFLMC/LGY, Autovon 921-4524

Competition in Contracting continued from page 26

the conclusions drawn from the data collected the authors recommend that:

1. Negotiation under the authority of 10 USC 2304(a)(16) be continued as the contracting method based on the need to divide current requirements among several contractors in order to insure that their assets are available in the event of a national emergency.

2. A fixed price type of contract should be used. This contract should include an escalation clause for fuel or a method such as the one presently used in which the government provides the fuel or reimburses the carrier for actual fuel costs incurred above a DOD-established rate.

3. The pricing method similar to that now used be continued with MAC setting the rate using the rules and procedures previously established by the CAB under part 288 of its economic regulations. This rate setting authority should be exercised with extreme caution to avoid the bias MAC may have as an interested party to the contract. The allocation of awards continues to be tied to CRAF participation but greater flexibility should be emphasized in order to include types of aircraft other than the L-100-30 and L-188C presently providing the domestic service. Additionally, if there is a need to modernize the fleet, a more definitive statement of CRAF requirements should be made available in order that MAC can better establish Mobilization Value (MV) points and incentivize modernization of the aircraft. The contract period should remain at one year thus providing carriers with continued business through periods of "slack" and eliminate the need to add additional contingencies because of the inflationary economy.

### Recommendations for Follow-on Study

The authors' recommendation of a contracting method is based on the data gathered and analyzed within the confines of this study. However, it is evident from the varied responses, as well as the continuing studies being accomplished in this area, that there may be a better method to contract for military air freight services and specifically domestic military air freight service while maintaining a flexible and sufficient CRAF. As such, the following list represents areas in which further research may provide insights in order to

increase the number of responsible sources. With increased capability, the marketplace may then be able to set competitive prices which will be considered fair and reasonable, not only in terms of an effective peacetime military air freight service, but also in terms of providing the CRAF necessary in case of national emergency.

1. What are the real costs associated with CRAF, and can such services be secured by other means independent of a contract for domestic military air freight service?

2. What pricing incentives should be used to enhance the amount of business awarded to the low bidder without jeopardizing CRAF participation?

3. Is the 60 percent commercial business requirement beneficial to the national defense, or is it an unnecessary restriction affecting overall costs and limiting competition?

4. How much longer can existing aircraft feasibly serve the market? What aircraft in the future might be needed?

5. How realistic are the CRAF requirements and should the CRAF be periodically exercised?

6. Can the Logair/Quicktrans requirements be satisfied with inhouse capability and only supplemented by existing cargo hauling companies? What effect would this have on CRAF?

7. What test procedure should be used to validate the recommendation of this research study?

8. What inducements can be provided to modernize the aircraft while meeting the constraints set by the 463L cargo handling system?

The authors have recommended a solution to the management question but in so doing have identified further areas of study which, when addressed, will add further insight into the overall area of military air freight service and the Civil Reserve Air Fleet.

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## Reader Survey

### What do you think about the *Air Force Journal of Logistics* (AFJL)?

The *AFJL* is now in its second year of publication as a professional logistics journal. Enough issues have been published to establish the scope of its subject matter, level of approach and manner of presentation.

We would like for you, our readers inside and outside the Air Force, to provide us feedback on the effectiveness of the publication to date, and what changes, if any, should be made.

You can help shape the future of the *AFJL* by responding to this reader survey.

### Survey Instructions

The attached mail back cards are designed to be read by an Optical Character Reader to ease handling and tabulation of your responses to the survey questions. Be careful not to tear the card when detaching it.

Use a #2 pencil to mark the response ovals on the card appropriate to each survey question. Make no other marks on the upper portion of the card.

By all means, do provide other comments in the space at the bottom of the card.

1. What is your current status?

- |                                       |                                     |
|---------------------------------------|-------------------------------------|
| A. Active USAF                        | F. Other DoD Civil Service          |
| B. Air National Guard or USAF Reserve | G. Non-DoD U.S. Government Employee |
| C. Other U.S. military                | H. Education                        |
| D. Other nation military              | I. Business/Industry                |
| E. USAF Civil Service                 | J. Other<br>(Specify in Comments)   |

2. What is your rank/grade?

- |                             |                            |
|-----------------------------|----------------------------|
| A. General Officer          | H. GS-16 through GS-18     |
| B. O-4 through O-6          | I. GS-13 through GS-15     |
| C. O-1 through O-3          | J. GS-9 through GS-12      |
| D. Warrant Officer          | K. GS-1 through GS-8       |
| E. E-7 through E-9          | L. Wage Grade              |
| F. E-1 through E-6          | M. Non-government Employee |
| G. Gov't civilian appointee |                            |

3. Which of the following major fields best describes your current job assignment?

- |                             |                                   |
|-----------------------------|-----------------------------------|
| A. Supply                   | I. Resources Management           |
| B. Maintenance              | J. Operations                     |
| C. Contracting              | K. Education/Training             |
| D. Transportation           | L. Research/Studies/Analysis      |
| E. Distribution             | M. Two or more of the above       |
| F. Logistics Plans/Programs | N. Other<br>(Specify in Comments) |
| G. Systems Acquisition      |                                   |
| H. Engineering and Services |                                   |

4. How do you normally obtain the *AFJL*?

- |                                     |                       |
|-------------------------------------|-----------------------|
| A. Official USAF distribution (PDO) | D. AFLMC distribution |
| B. GPO subscription                 | E. Library            |
| C. OCPO distribution                | F. Friend             |
|                                     | G. Unknown            |

5. How many other readers do you estimate will see this copy of the *AFJL*.

- |                |                      |
|----------------|----------------------|
| A. Only myself | D. Eleven to fifteen |
| B. One to five | E. Sixteen or more   |
| C. Six to ten  | F. Do not know       |

6. The number of copies distributed to your duty section through official USAF channels is:

- |               |  |
|---------------|--|
| A. Enough     | D. None  |
| B. Not Enough | E. Not eligible for official USAF distribution |
| C. Too many   |  |

7. When did you first see this issue?

- |                   |                 |
|-------------------|-----------------|
| A. Before 5 April | H. 6-10 May     |
| B. 6-10 April     | I. 11-15 May    |
| C. 11-15 April    | J. 16-20 May    |
| D. 16-20 April    | K. 21-25 May    |
| E. 21-25 April    | L. 26-31 May    |
| F. 26-30 April    | M. After 1 June |
| G. 1-5 May        |                 |

8. This is the sixth quarterly issue of the *AFJL*. How many issues have you seen?

- |                      |         |
|----------------------|---------|
| A. This is the first | D. Four |
| B. Two               | E. Five |
| C. Three             | F. Six  |

9. How much of each issue do you usually read?

- |                                       |                                     |
|---------------------------------------|-------------------------------------|
| A. All                                | E. Very little                      |
| B. Most                               | F. Look at but seldom read          |
| C. About half                         | G. Sometimes little; sometimes most |
| D. One or two articles or departments |                                     |

10. Do you, or does your office or organization, retain back issues of the *AFJL*?

- A. Yes    B. No    C. We are going to    D. Do not know

11. Which of the following describes the value of the *AFJL* to you? (Select as many as applicable)

- |   |  |
|---|--|
| A. Have used some contents in my work/professional life   | D. Informative-usually learn something new from each issue |
| B. Some ideas/information may be useful in the future     | E. Interesting   |
| C. Educational-increased my understanding of AF logistics | F. Uninteresting   |
|   | G. No value  |



Please rate each of the following:

	<i>Poor</i>	<i>Unsatisfactory</i>	<i>Satisfactory</i>	<i>Good</i>	<i>Excellent</i>
12. Layout (General Appearance)	A	B	C	D	E
13. Type (print & size)	A	B	C	D	E
14. Proofreading (Composition accuracy)	A	B	C	D	E
15. Graphics (Tables & Charts)	A	B	C	D	E
16. Article quality	A	B	C	D	E
17. Article thoroughness	A	B	C	D	E
18. Article variety	A	B	C	D	E
19. Current Research Department	A	B	C	D	E
20. Career and Personnel Information Dept.	A	B	C	D	E
21. USAF Logistics Policy Insight Department	A	B	C	D	E
22. Specials	A	B	C	D	E
23. Items of Interest	A	B	C	D	E
24. Back Cover Quotes	A	B	C	D	E
25. Overall Relevance	A	B	C	D	E

26. The *AFJL* meets its purpose as stated on the content page of each issue and quoted here in part: "... to serve as an open forum for presentation of research, ideas, issues and information of concern to professional Air Force logisticians."

A. Strongly Disagree  
B. Disagree  
C. Undecided  
D. Agree  
E. Strongly Agree

27. How do you rate the *AFJL* in comparison with other logistics publications?

A. The best  
B. Among the top few  
C. Better than most  
D. Average  
E. Worse than most  
F. Among the worst  
G. The worst  
H. I am not familiar with any other logistics publications

28. What other regular departments or features would you like to have in the *AFJL*? (Select as many as applicable)

A. Analytical Tips  
B. Book Reviews  
C. Calendar of Events  
D. Letters to the Editor  
E. Other  
(Specify in Comments)  
F. None-leave it as is

### RESPONSE CARD MISSING?

We still want to hear from you!

Make copies of these pages, mark your responses to the questions, add your other comments about the *AFJL* and mail to:

Reader Survey  
*Air Force Journal of Logistics*  
AFLMC  
Gunter AFS, AL 36114

**Comments Section:** Use the space provided at the bottom of the answer card to make other comments about the *AFJL* and to indicate logistics topics you would like addressed in future issues. If you need more space, mail your additional comments and the response card together in an envelope back to the Reader Survey address.

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## Competitive Contractor Field Teams

Norman Cohen  
Group Leader  
Contract Field Team Administration Office  
Air Force Contract Maintenance Center  
Air Force Logistics Command  
Wright-Patterson AFB, Ohio 45433

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In general, Contractor Field Teams (CFT) are an extension of the Government's depot level maintenance capability. They provide a fast response labor pool of skilled technicians to satisfy urgent operational maintenance and modification requirements that cannot be met with other resources normally available to the System or Item Managers (Depot Shops, Area Assistance Teams, Contractor Fixed Facilities, and Contractor Engineering and Technical Support Representatives). The Air Force Logistics Command (AFLC) competitive CFT contracts provide a framework to obtain the type of skills necessary to support maintenance requirements for almost every system and subsystem for which AFLC has logistics support responsibility.

Under CFT contracts, contractors provide company program management to complete specified maintenance tasks, the technical specialist support directed in contractual orders, and the normal handtools associated with the skill specialties. They work in accordance with their own administrative, quality control, technical and safety procedures which are subject to Government review and concurrence. The Government provides all other requirements (program direction, data, parts, kits, special tools and equipment, facilities, etc.) or, under the Contractor Acquired Property (CAP) provisions of the Basic Contract, authorizes the contractors to rent or buy what it cannot furnish.

The Air Force pioneered the CTF program during the Korean crisis in 1950 and it has continued since that time. The primary directives governing the program are AFR 66-11, *Contractor Field Team (CFT) Administration and Use*; AFLCR 66-33, *Contract Field Team*; Technical Order 00-25-107, *Maintenance Assistance*; and Technical Order 00-25-108, *Maintenance of Communication-Electronic, Meteorological and Cryptographic Equipment*. These directives provide the authority to define the responsibilities of Government agencies that make the CFT program the workable, viable, and responsive system that it is today.

### Other Service Participation . . . and Benefits

Under the original CFT concept, order tasks were generally limited to maintenance, modification and repair of aircraft, engines and associated equipment. In 1975, the AFLC Commander invited the Commander of the Army Materiel Command and Chief of Naval Material to use the AFLC CFT contracts to satisfy their CFT type requirements. Since that time the scope of the CFT tasks has expanded to include combat vehicles, landing craft, mobile assault bridges and even locomotives for the Army; and jet engine test stands and miscellaneous equipment for the Navy.

Since 1950, when less than 150 CFT personnel performed at scattered worldwide sites at a total cost of a fraction of a million dollars through its last full year of operation in FY 80 (when as many as 1,600 CFT personnel performed at any one time at almost every base operated by the Armed Services at a

cost in excess of \$46 million), the CFT program has proved its worth in providing timely and cost effective maintenance, modification, and repair support that would be otherwise unavailable.

The basic CFT contract is fundamentally a Basic Ordering Agreement (BOA) against which Time and Material, or more rarely, Firm Fixed Priced Orders may be released. It establishes contractual agreements applicable to all orders issued under it. The orders are thus simplified in that they contain only the essential particulars related to performance requirements (tasks to be performed, schedule, team composition, site location and funding data). Most orders are issued under a time and material basis because typical CFT tasks do not lend themselves to fixed priced negotiations. Negotiated time and material rates are structured to reduce hourly rate cost as the contractor provided manhours increase. As an example, the Government pays the contractors an average of \$14.57 an hour for a general mechanic at a CONUS worksite when it has less than 150 employees in the field, but only \$12.26 an hour when its field population exceeds 1,000. This pricing arrangement is especially favorable to the Government since collectively the three participating Services enjoy a more favorable hourly rate than could be achieved under separately awarded contracts.

### Current Contracts

Contractors participating in the CFT program are selected under the Competitive Acquisition Process in response to Request for Proposals (RFP) under the AFLC Five Year Award Policy. The competitive selection was last exercised in 1978 when Lear Siegler, Inc. (Management Services Division) and Dynalectron Corporation (Aerospace Operations Division) were successful bidders. Currently both contractors are performing in the third year of CFT contract awards. Oklahoma City Air Logistics Center (OC-ALC) is the AFLC designated activity for CFT contractor source selection and award of the basic contracts. The basic contracts contain authority for release of CFT contract orders by other Air Logistics Center's acquisition activities and the Air Force Systems Command. OC-ALC also issues CFT orders fulfilling Military Interdepartmental Purchase Requests (MIPRs) requirements for the Army and Navy. All competitive CFT contracts are administered by the Air Force Contract Maintenance Center (AFCMC), an organization under AFLC, located at Wright-Patterson Air Force Base.

This brief glimpse of what the competitive CFT program is, what it does, how it operates, and what it costs, was primarily written to encourage readers to judiciously appraise its current value, assist us in determining how it can be applied to the Government's better advantage, and, in the long run, provide the three Services with more help per dollar than they can get any other way. If you have any questions or suggestions, please address them to AFCMC/PMMACT, Wright-Patterson AFB, Ohio 45433; Autovon 787-2567 or 787-2138.

## Information for Contributors

**General.** The *Air Force Journal of Logistics* is dedicated to the open examination of all aspects of issues, problems, and ideas of concern to the Air Force logistics community. Constructive criticism of logistics as it exists today is encouraged if it is issue oriented, rationally expressed and indicates the positive action necessary for future improvement. Contributions are welcome from any source inside and outside the Air Force.

**Scope.** The *AFJL* will consider for publication articles and research results that add to the understanding or improvement of any aspect of Air Force logistics from maintenance, supply, transportation, and logistics plans, to engineering and services, munitions, and contracting and acquisition; from base-level and operational units to depot-level and military and civilian industrial and production logistics; from logistics civilian, enlisted and officer personnel and manpower requirements to training and education; from internal organizational structure, policies and procedures to external relations with other services, government agencies, civilian industry and allies; from daily mission support challenges to the logistics aspects of national security objectives and Air Force strategy, doctrine and tactics.

**Special Interest.** Articles are especially invited that:

- ☐ give the results of the application of sound analytical and research techniques to existing Air Force logistics operations;
- ☐ offer possible alternatives to current operations based on a logical assessment of today's posture and tomorrow's requirements;
- ☐ demonstrate the interrelation of various parts of Air Force logistics systems internally and with non-USAF systems;
- ☐ consider basic Air Force logistics functions and issues from an unusual perspective;
- ☐ focus on logistics and Air Force mission accomplishment;
- ☐ or, provide insight into the reasons for and impact of recent or future changes in Air Force logistics.

**Original Material and Revisions.** Submitted articles are received with the understanding that:

1. They have not been published nor are being considered for publication elsewhere. Articles based on research planned for publication *only* as an in-house report or in symposium proceedings are acceptable.

2. Those articles with multiple authors have been approved by all. The *AFJL* will work with the lead author in preparing the manuscript for publication with the

understanding that any approved changes are acceptable to all.

3. To the greatest extent possible, necessary revisions in the manuscript will be coordinated with the author.

**Length.** In general, manuscripts should be between 2000-3500 words. Shorter and longer papers may be published on an exceptional basis. Formal research papers should briefly recognize the most significant research accomplished in the area of investigation and the relation of that research to the work addressed in the paper. A 50-75 word abstract should accompany each manuscript.

**Format.** Manuscripts should be typed with one inch margins, double-spaced on one side of standard size bond paper. References should be numbered and double-spaced on a separate page(s) at the end of the manuscript. The double number system for identifying references within the article should be used, i.e., (7:15), with the first number identifying the number of the source in the reference list and the second number indicating the specific page number in that source. When possible, potential textual footnote material should be incorporated in the main body of the article. Do not include a separate bibliography.

**Figures and Tables.** Supporting figures, if any, should be numbered consecutively and prepared on separate pages, one to a page. The text should clearly indicate where each figure is to appear. Tables should be numbered consecutively and be prepared within the appropriate text of the manuscript.

**Awards.** Published articles are eligible to compete for the Most Significant Article Award in each issue. The quarterly award winners will compete for the annual award from the *AFJL*. Selection is made by the members of the *AFJL*'s Editorial Advisory Board. Articles published by the Editorial staff, Contributing Editors, and Editorial Advisory Board are ineligible for the awards.

**Reprints.** Permission for schools and other publications to reprint material appearing in the *AFJL* will usually be granted, if requested.

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***“ . . . the Season is late, and there is a material difference  
between voting of Battalions and raising of Men.”***

(George Washington, 1776)

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